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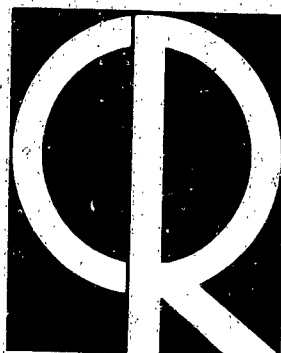
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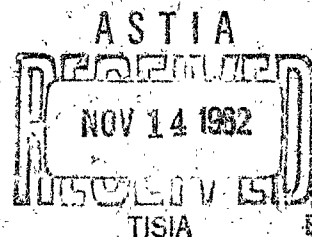
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Research Note



Geophysical Data from U.S. Arctic Ocean Drift Stations
1957-1960

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TERRESTRIAL SCIENCES LABORATORY PROJECT 7628

AIR FORCE CAMBRIDGE RESEARCH LABORATORIES, OFFICE OF AEROSPACE RESEARCH, UNITED STATES AIR FORCE

Abstract

Geophysical data taken from March 1957 to September 1960 at the three United States Arctic Ocean drifting stations, ALPHA, T-3 (BRAVO), and CHARLIE, are presented. The tabulations include station positions, ocean depths, oceanographic data, observed gravity and anomalies, and values of some of the magnetic elements. Field procedures are described. A bibliography of reports derived from the scientific programs during this period is included.

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Geophysical Data from U.S. Arctic Ocean Drift Stations 1957-1960

1. INTRODUCTION

In early 1957, PROJECT ICE SKATE was initiated to establish and provide support for the United States drifting research stations in the Arctic Ocean. These stations served as convenient, stable floating platforms for geophysical and related research programs as formulated by the United States National Committee for the International Geophysical Year and the International Geophysical Cooperation - 1959.

The first two stations, ALPHA and BRAVO, were first occupied in the Spring of 1957; ALPHA, on an ice floe at 79°20'N, 149°W; and BRAVO, on Fletcher's Ice Island, T-3 (formerly manned as a weather and geophysical research station in 1952-54 and 1955), at 82°46'N, 99°33'W. Station ALPHA was evacuated because of dangerous ice conditions on 6 November 1958 at 86°12'N, 113°08'W. CHARLIE, a replacement for the abandoned ALPHA, was set up in June 1959 near 75°N, 162°W, but was abandoned 7 January 1960 at 76°48'N, 169°20'W, again due to hazardous ice conditions. BRAVO was manned until October 1961, although the ice island had been grounded on the continental shelf 100 km north of Pt. Barrow, Alaska, since July 1960. (See Figures 1-6.)

The United States Air Force, through the Geophysics Research Directorate of the Air Force Cambridge Research Laboratories (formerly the Air Force Cambridge Research Center), and the United States Navy, through the Office of Naval Research, and other government agencies provided the support, scientists, and technicians for the scientific mission, both directly and through research contracts with educational and research institutions. (See Table 1.) The scientific studies undertaken and the agencies that participated at one time or another are outlined in Table 2. The station camps were manned by military personnel, operated, and supported logistically (Author's manuscript approved for publication, 5 June 1962)

Figure 1. Drift track of ALPHA.

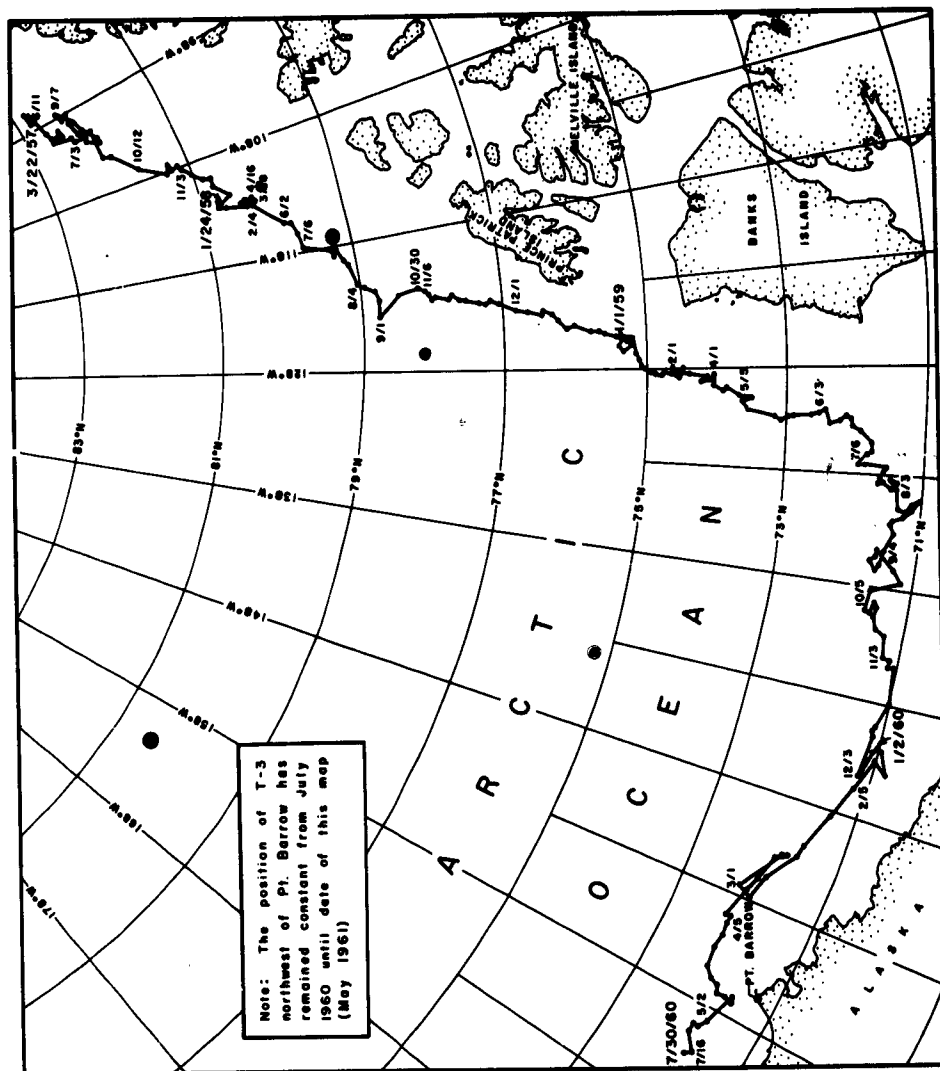


Figure 2. Complete drift track of Fletcher's Ice Island T-3 (BRAVO), 1957 - 1960.

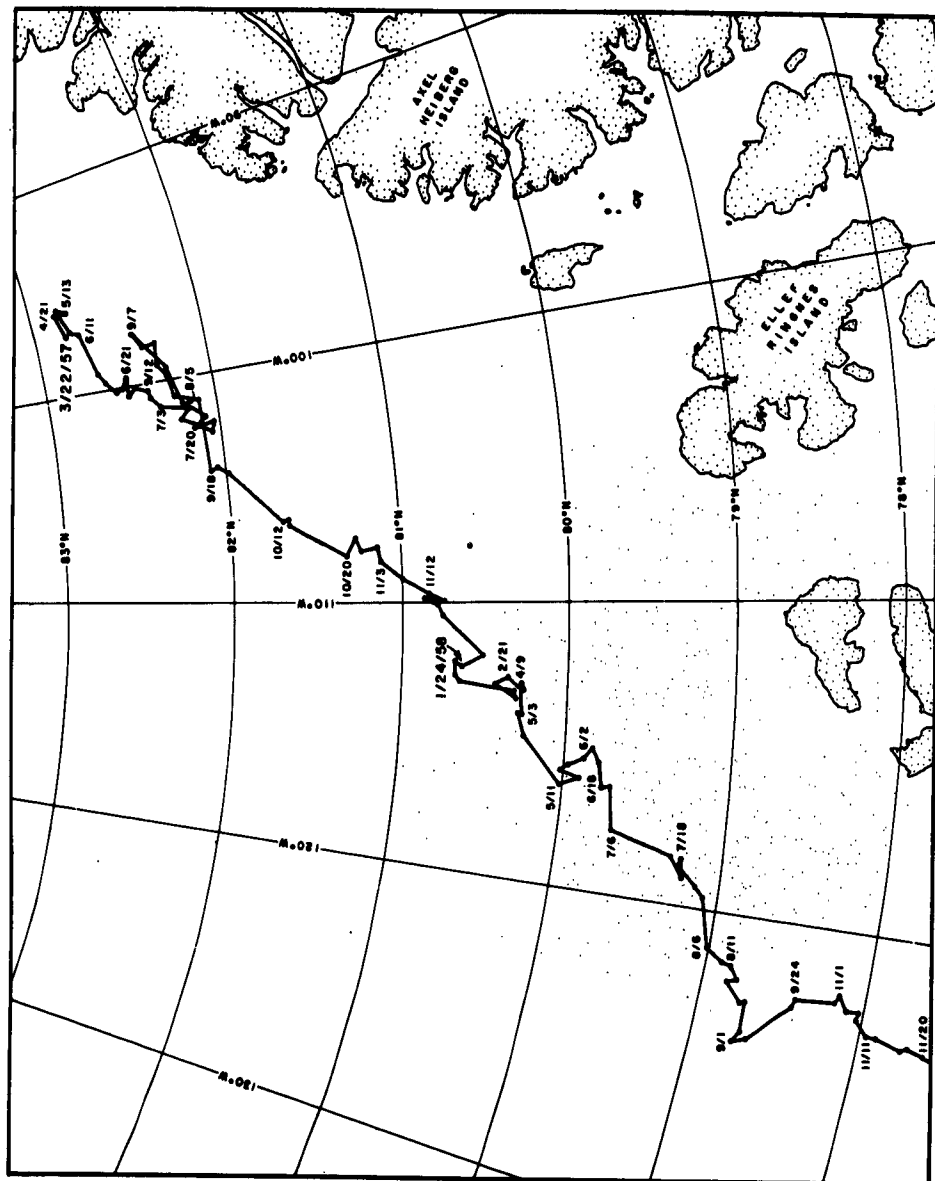


Figure 3. Section of T-3 (BRAVO) drift track, March 1957 - November 1958.

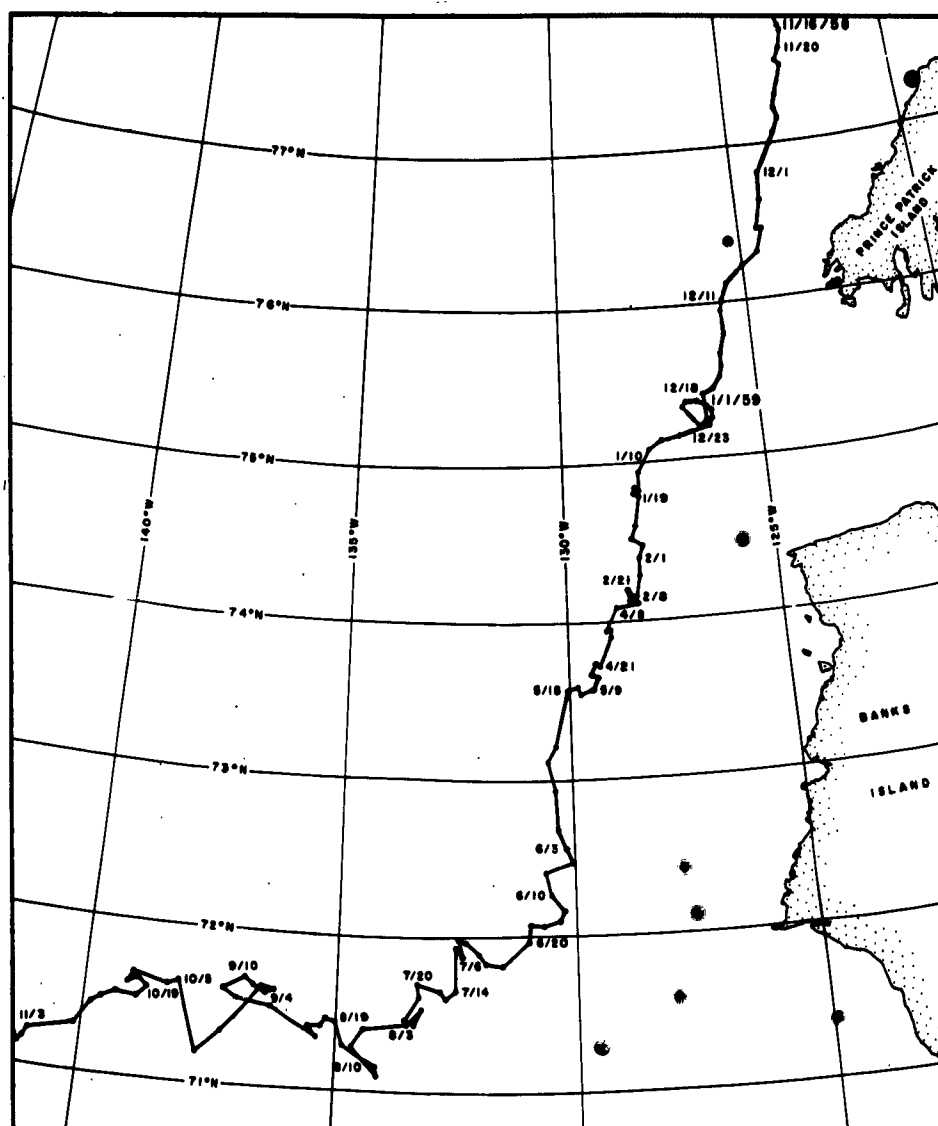
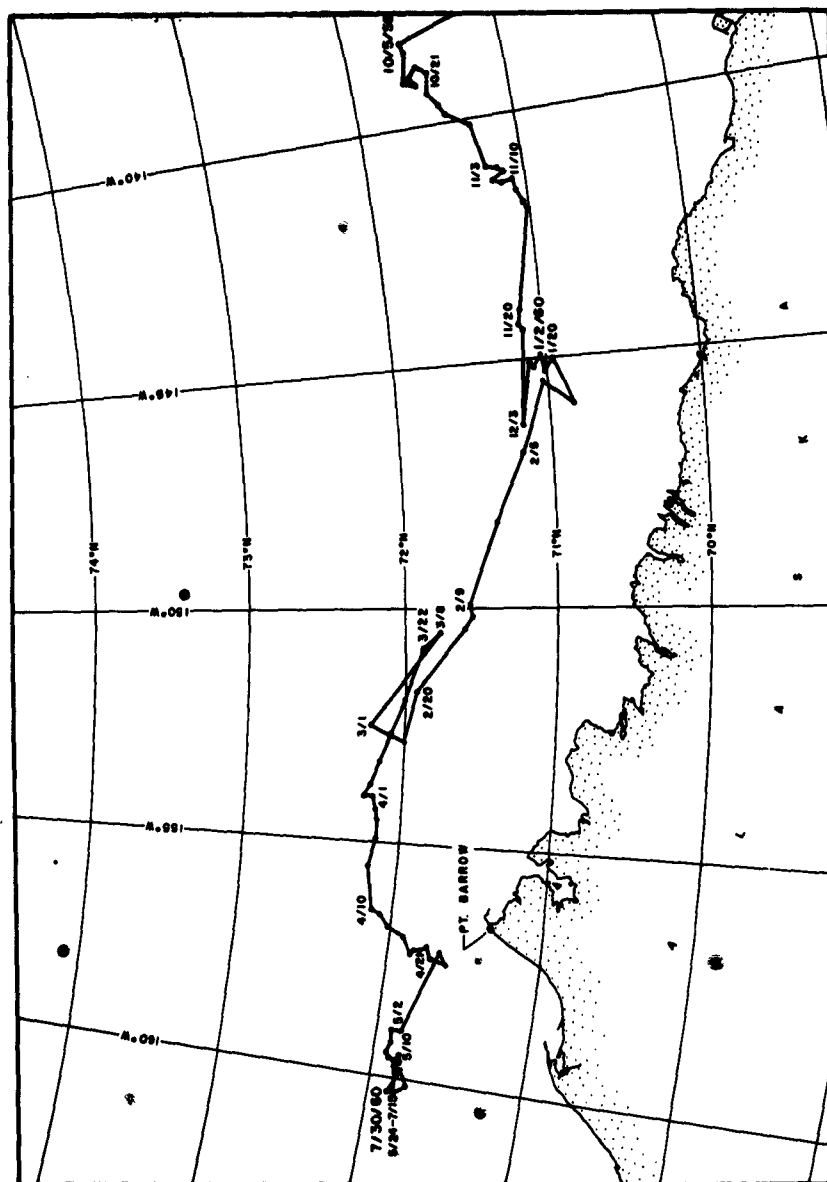


Figure 4. Section of T-3 (BRAVO) drift track, November 1958 - October 1959.



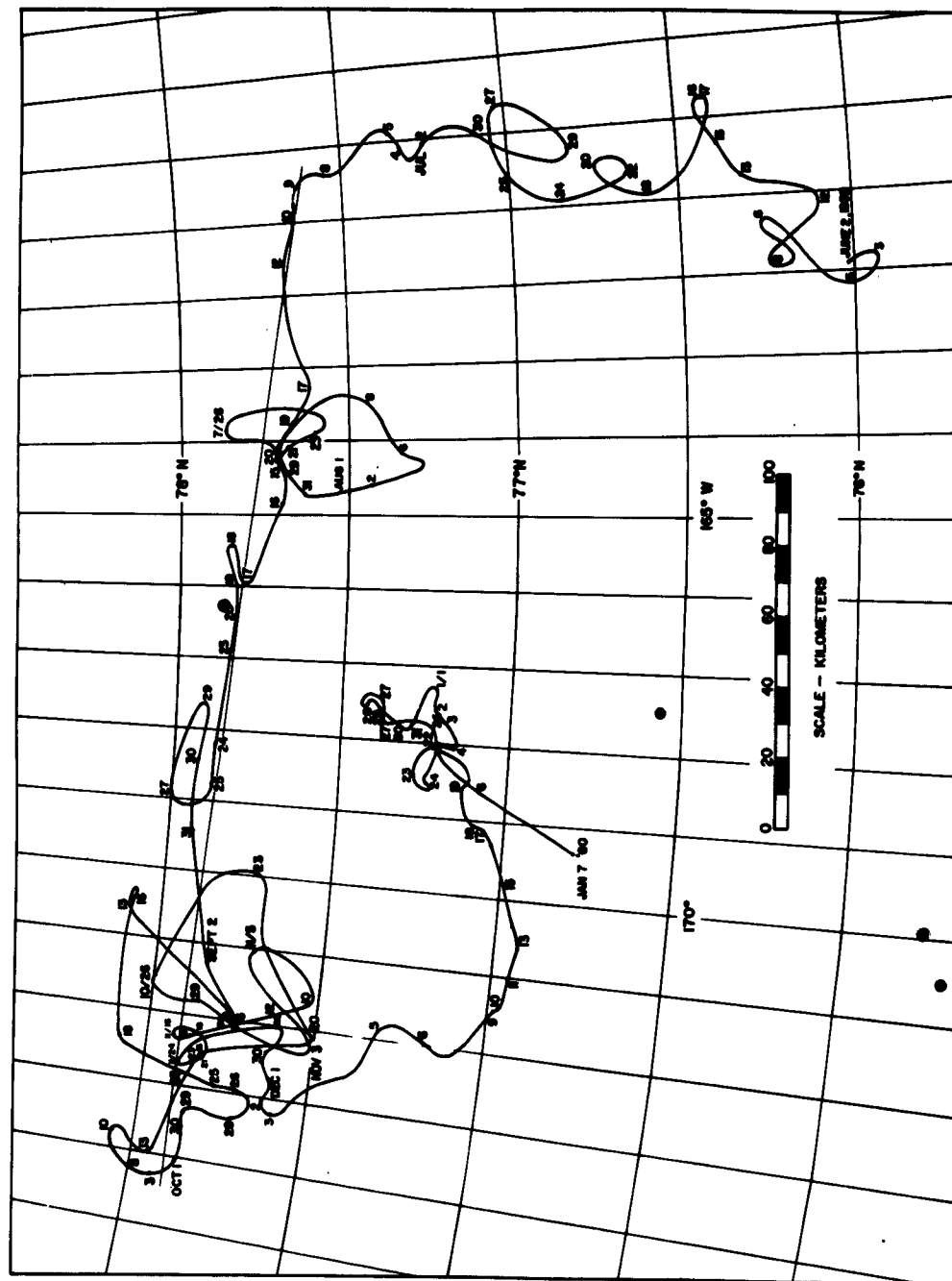


Figure 6. Drift track of CHARLIE (from Hunkins, 12 et al, 1962).

by the Northeast Air Command, the Strategic Air Command, and the Alaskan Air Command of the United States Air Force.

A more detailed summary of the IGY and IGC drift station programs has been presented by Cotell³ (1960). Most of the scientific reports resulting from the earlier (1952-1955) occupations of Fletcher's Ice Island, T-3, have been collected by Bushnell¹ (1959 and 1960).

In the summer of 1960, the Arctic Research Laboratory, operated by the University of Alaska through a contract with the Office of Naval Research, established a new drifting station, ARLIS I, on an ice floe north of Alaska. This station served as an austere equipped platform for scientific investigations from August 1960, through March 1961. In early June 1962, ARLIS II was set up on a small ice island and is still occupied at this time (April 1962). Research programs on these stations were similar to those conducted on the IGY-IGC stations. Fletcher's Ice Island, T-3, although grounded, was the site of extensive studies in the spring and summer of 1961 by the Lamont Geological Observatory in terrestrial magnetism, wave propagation through sea, ice, air, and crust, and tidal phenomena. T-3 was abandoned in October 1961, because its value became limited when it went aground. However, in late February 1962 the ice island broke free and began drifting into deeper waters northwest of its grounded position. The station is being reoccupied as a research facility under the U. S. Navy Office of Naval Research.

In this report geophysical data obtained from ALPHA and CHARLIE during their entire periods of occupation and from T-3 (BRAVO) until September 1960, are presented. The selection was governed somewhat by the duration of the various field programs but primarily by the nature of the data and the homogeneity of the results. By this criterion the results of the sea-ice petrofabric and micro-meteorological programs, for example, have been omitted; the former, because of its descriptive nature; the latter, on the basis of its complexity of interpretation and dependence on instrumentation, observer technique, and environmental factors.

The surface meteorological observations are being presented separately by the U. S. Weather Bureau²³ (in preparation).

In this report the following data are tabulated:

- Station positions
- Bathymetry
- Oceanographic observations
- Acceleration of gravity
- Magnetic elements

Certain portions of these results have been and are being subjected to analysis and interpretation, with subsequent publication in the scientific literature. (See BIBLIOGRAPHY.) Much, however, has not yet been presented and, while it is not sufficiently comprehensive to permit adequate analysis, it will undoubtedly be valuable to future research in the Arctic Basin.

The tabulations are arranged, first, by subject; second, by station.

Table 1. Organizations participating in United States drifting station scientific program 1957-1960.

AFCRL	- Air Force Cambridge Research Laboratories and their contractors: AINA - Arctic Institute of North America DARTMOUTH - Dartmouth College LAMONT - Lamont Geological Observatory (Columbia University) USGS - U. S. Geological Survey (Department of the Interior) WHOI - Woods Hole Oceanographic Institution
ONR	- Office of Naval Research contractors: UNIV. WASH. - University of Washington USC - University of Southern California UNIV. ALASKA - University of Alaska
USNBUSHIPS	- U. S. Navy Bureau of Ships (through Pickard and Burns, Inc.)
USNHO	- U. S. Navy Hydrographic Office
USNUSL	- U. S. Navy Underwater Sound Laboratory
SIPRE	- U. S. Army Snow Ice and Permafrost Research Establishment (Corps of Engineers) (Now the Cold Regions Research and Engineering Laboratory)
USASRPA	- U. S. Army Signal Radio Propagation Agency
USWB	- U. S. Weather Bureau (Department of Commerce)
FRB	- Fisheries Research Board of Canada

Table 2

STUDY	INVESTIGATOR
<u>The Ocean Floor</u>	
Seismic reflection and refraction studies Coring and dredging of bottom sediments Underwater photographs Electrical resistivity	AFCRL, Lamont, USGS, AINA AFCRL, Lamont, Univ. Wash. Lamont USGS
<u>The Ocean</u>	
Physical and chemical oceanography, and primary productivity	WHOI, FRB, AINA, Univ. Wash., USNHO
Marine animals	USC
Currents and tides	AFCRL, Lamont, Univ. Wash.
Sound propagation	Lamont, USNUSL, AFCRL
Electrical properties	USGS
<u>The Ice</u>	
Sea Ice	
Temperature, density, thickness	Univ. Wash., AINA
Seismic studies of Elastic Properties	Lamont
Crystallography and petrofabrics	AINA, Univ. Wash., SIPRE
Electromagnetic properties	USGS
Morphology and deformation	USNHO, Lamont, Univ. Wash.
The Ice Island (T-3)	
Structure and stratigraphy	AFCRL, AINA, Dartmouth
Physical properties	AINA
Thickness	USGS, AINA
Temperatures and density	AINA, AFCRL
Surface morphology	Dartmouth, AINA, AFCRL
Surficial deposits (rock and plant materials)	Dartmouth, Lamont

Table 2 (cont.)

<u>The Atmosphere</u>	
Micrometeorology	Univ. Wash., AINA
Surface meteorology	USWB; Univ. Wash., AFCRL
Synoptic observations	
Solar radiation	
Albedo	
Upper-air meteorology	AFCRL, USWB
Ionospheric phenomena	AFCRL, USNBUSHIPS, USNUSL, USASRPA
<u>General Geophysics</u>	
Gravity	AFCRL, USGS, Lamont
Geomagnetics	AFCRL, USGS, Lamont, Univ. Alaska
Earth Currents	Univ. Alaska
Ice drift	AFCRL, Univ. Wash.

Preceding each section is a brief summary of the field methods used and some estimate on the validity of the results. If observational techniques differed greatly from station to station, sub-section comments are included.

A list of references cited in the introduction and in the explanatory comments and a bibliography of reports derived from the drift station studies of 1957-1960 are included.

2. STATION POSITIONS

Geographical positions at all stations were obtained by celestial navigational methods daily when weather conditions permitted. Overcasts prevalent in the Arctic Ocean basin during the summer periods increased the time intervals between successive positions.

The sun and moon were used for navigational purposes during the daylight periods; the stars, during the winter darkness; and occasionally the planets, during twilight. It was possible to utilize stars long after the sun appeared above the horizon by precomputing stellar positions.

Horizontal and vertical angles to celestial bodies were measured with various types of optical surveying instruments, usually theodolites, wherein spirit levels were used as reference controls. Angles could be read to 0.01° or $0.1''$, depending upon the type of instrument. Two pointings were normally made to each body; the telescope was reversed between each sighting, and the two angles averaged. These vertical angles were corrected for atmospheric refraction by means of nomograms, with air temperatures, atmospheric pressure, and observed altitude as variables.

Lines of position (LOP's) were derived by marine navigational sight reduction methods using the Air Almanac or Nautical Almanac and Tables of Computed Altitude and Azimuth (H. O. Pub. 214) or Dead Reckoning Altitude and Azimuth Table (H. O. Pub. 211 - Ageton). The three LOP's closest in time were normally used to fix any one position, although two were occasionally used. These were plotted on sheets especially constructed for the purpose. Scales of the plotting sheets varied from approximately 1:556,000 to 1:1,000,000 depending upon the responsible agency and the period of occupation. One minute of latitude was considered equivalent to one nautical mile for plotting purposes. The center of the small triangle (or polygon) formed by the intersecting LOP's was considered to be the position of the station at the mean time of any one series of shots, although the true position is not necessarily within the boundaries of the figure.

All celestial shots were referred to Greenwich Mean Time (GMT). A stop or navigator's ('hack') watch was used to time the observations. The watch was rated against a ship's chronometer, which in turn was rated against radio time signals daily when radio propagation conditions permitted. The sight instant was given by voice signal to an assistant who noted the time and recorded the angles or,

was determined from a stop watch operated by the observer. When angles were taken with the telescope in both direct and reversed positions, as was normally done, the times were averaged.

The "ERROR" listed in the tables is the radius, in nautical miles, of the circle inscribed in the LOP polygon. Although this convention does not necessarily express the actual error (e.g., a small, constant inaccuracy in time would shift the entire LOP polygon in longitude without changing its dimension), it and the number of LOP's should give an indication of accuracy. The accuracy and precision were dependent, for example, upon the instrument and its condition; the experience of the observer; the difference between actual and computed refraction; the geometrical relationships among the celestial bodies observed; surface meteorological conditions (which affected the performance of the observer); and, therefore, upon the distribution of any random or systematic errors derived from the above. In addition, when the sun alone was used for navigational purposes, a time interval was necessary between shots to establish sufficient separation between lines of position, during which movement of the station might have occurred. It is estimated that the great majority of the errors do not exceed 0.5 nautical mile, and, in the winter, 0.3. With large-scale plotting sheets the positions could be read to 0.1 mile.

Instruments were left "on station" at all times to avoid damage to the optical systems caused by sudden temperature changes. At the beginning of each ablation season the instruments were installed on wooden piers planted eight feet into the ice to prevent level shifts, which would have resulted from differential melting of the tripod feet into the ice.

The orientation of an arbitrary reference line at each station was obtained, concurrently with position, from horizontal angles measured from a range pole to the celestial bodies. The true azimuth was calculated from the mean of the true bearings of the same navigational bodies employed for positional determination. The deviation from the mean seldom exceeded 0.1° for star shots, and 0.3° for sun shots (except when the angular velocity of the stations was high). Azimuths are tabulated to 0.1° .

2.1 Alpha Positions

Station locations were determined by scientists from the Lamont Geological Observatory (Hunkins, ¹¹ 1960) during the entire period of drift. A David White balloon theodolite (reading to 0.01°) was the primary navigational instrument. Preliminary results were calculated in the field; all positions were recomputed and replotted in the home office. In the original listing furnished by LGO, results were given to $0.1'$ of latitude and $1.0'$ of longitude; in the following tabulation the values of latitude have been rounded to $1'$ of arc. Errors are considered not to exceed 0.5 nautical miles.

EXPLANATION OF TABLES

<u>TIME</u>	Average to the nearest hour of Greenwich Mean Time of the times of the shots used for the fix
<u>LATITUDE</u>	Degrees and minutes of arc
<u>LONGITUDE</u>	Degrees and minutes of arc
<u>LOPS</u>	Number of lines of position used to fix the position
<u>ERROR</u>	Radius of circle inscribed in LOP polygon in nautical miles
<u>AZIMUTH</u>	Orientation of reference line in degrees, measured clockwise from true north
<u>DR</u>	Dead reckoning used in conjunction with an LOP to fix a position
*	Denotes radius of circumscribed circle, used for small angles between LOP's, to indicate ERROR

DATE (1957)	TIME (GMT)	LATITUDE (NORTH)	LONGITUDE (WEST)	LINE OF POSITION	ERROR (MILES)	AZIMUTH (DEGREES)
8 JUN	1100	80 51	160 17			
9	1100	80 54	159 29			
11	1100	81 02	159 48			
12	1100	81 05	160 00			
14	1100	81 10	160 42			
15	2300	81 09	161 28			
16	2300	81 11	162 01			
17	2300	81 15	163 48			
18	2300	81 14	163 50			
23	2300	81 06	162 48			
26	2300	81 22	163 36			
28	2100	81 30	164 25			
29	1100	81 36	164 36			
30	1100	81 38	164 34			
5 JUL	0100	81 57	164 55	3	0.8*	297.6
6	0900	82 10	164 29	3	0.1	299.3
7	1200	82 13	164 35	4	1.0	299.5
8	1200	82 15	165 28	4	0.4	298.8
9	0900	82 27	165 43	1	-	299.7
13	0900	82 33	166 05	2	-	302.6
15	2200	82 43	165 39	2	-	302.3
16	1200	82 53	165 29	3	0.1	301.5
22	1900	82 45	166 50	3	0.1	295.8
25	1200	82 55	167 23	4	0.4	295.2
26	2200	82 51	167 48	3	0.3	293.0
28	2300	82 59	167 11	4	0.3	288.2
29	2200	83 04	167 17	3	0.1	287.6
30	2100	83 06	167 14	3	0.3	284.6
31	2300	83 15	167 28	4	0.7	283.7
1 AUG	2200	83 12	166 52	2	-	286.5
2	2200	83 19	166 18	3	0.3	282.4
4	2400	83 37	166 27	4	0.4	279.7
5	2300	83 40	166 22	3	0.2	281.5
7	0900	83 53	167 19	3	0.2	285.4
9	0400	83 53	168 51	2	-	285.0
10	2200	83 53	167 40	4	0.2	286.5
13	1800	84 03	166 10	2	-	289.2
14	1600	84 06	166 14	2	-	288.6
19	1800	84 12	168 31	2	-	285.6
20	2200	84 21	168 52	2	-	282.3
22	2100	84 28	169 30	4	0.3	274.2
24	2400	84 43	169 31	3	0.6	266.7
25	2400	84 40	169 58	2	-	270.0
27	2000	84 38	171 30	2	-	286.3
28	2200	84 37	171 05	4	0.4	287.9
29	2300	84 43	171 05	3	0.3	284.0
31	2200	84 40	171 41	3	0.4	282.9
3 SEP	2000	84 51	169 32	2	-	278.6
4	2000	84 59	168 39	3	0.1	281.4
5	2300	85 01	168 51	3	0.3	282.4
7	2200	85 11	167 10	2	-	288.0
9	2000	85 23	165 28	2	-	292.4
11	0100	85 20	167 00	2	-	292.2
11	2400	85 22	167 40	3	0.3	292.4
12	2300	85 24	167 25	3	0.4	295.0
14	2400	85 30	167 42	3	0.1	297.8
16	2200	85 28	168 09	3	0.2	297.6
17	2000	85 28	168 08	3	0.2	298.3
18	2200	85 26	169 22	3	0.3	297.8
19	2200	85 23	169 06	3	0.3	297.7
20	2200	85 23	168 57	4	0.4	297.2
22	2200	85 27	169 50	4	0.5	295.6
25	2300	85 32	171 10	3	0.4	296.7
1 OCT	0800	85 21	172 44	2	-	298.0
7	0800	85 02	172 11	3	0.1	296.0

DATE (1957)	TIME (GMT)	LATITUDE (NORTH)	LONGITUDE (WEST)	LINE OF POSITION	ERROR (MILES)	AZIMUTH (DEGREES)
8	OCT 0600	85 02	172 18	3	0.1	295.2
9	0600	85 01	173 05	3	0.3	294.4
10	0400	84 59	173 57	3	0.1	295.0
12	2000	85 01	176 12	4	0.3	290.9
14	0300	85 03	176 07	3	0.2	289.5
18	1400	84 30	174 15	3	0.1	293.9
19	1000	84 39	174 47	3	0.2	293.3
21	1900	85 04	174 52	3	0.2	293.2
22	2000	85 06	172 02	4	0.4	295.8
23	2100	85 06	171 22	2	-	298.3
25	0300	85 02	170 34	3	0.4	301.2
26	0600	85 01	170 04	4	0.3	301.9
27	0200	85 01	169 49	3	0.1	301.2
29	0400	84 49	167 59	3	0.3	300.2
30	1900	84 43	169 07	4	0.3	299.6
31	0300	84 42	169 31	4	0.1	301.7
31	2000	84 38	169 42	4	0.4	300.0
1	NOV 2100	84 35	170 36	4	0.2	300.2
2	2000	84 34	170 57	3	0.3	300.4
3	2400	84 35	170 44	4	0.2	301.5
4	2000	84 36	170 38	4	0.2	303.0
5	2100	84 33	170 10	4	0.2	303.2
6	2000	84 28	169 58	4	0.2	303.5
7	2100	84 26	169 37	4	0.2	304.2
8	1900	84 24	169 37	4	0.4	305.4
9	1900	84 22	169 18	5	1.2	306.1
10	2000	84 18	169 06	4	0.3	307.0
11	2000	84 16	168 44	4	0.1	307.1
12	2000	84 14	168 17	5	0.6	308.6
13	2400	84 15	167 40	4	0.5	308.8
14	1900	84 17	167 24	4	0.7	309.1
16	1900	84 20	166 16	3	0.3	310.6
17	2100	84 25	166 08	4	0.4	309.4
18	2100	84 24	165 50	3	1.0	310.1
19	2000	84 17	165 29	4	0.2	310.7
20	2000	84 11	165 22	5	0.8	312.3
21	2000	84 03	165 20	4	0.3	312.5
22	1900	83 57	165 23	5	0.6	313.1
23	2000	83 52	165 28	3	0.5	313.3
24	2000	83 48	165 34	4	0.3	314.6
25	1900	83 48	165 48	4	0.4	314.7
26	1900	83 45	165 58	4	0.2	315.1
27	2000	83 43	166 13	4	0.2	315.0
28	2100	83 42	166 17	4	0.3	315.4
29	2100	83 41	166 00	5	0.7	316.5
30	1900	83 40	165 39	4	0.2	317.4
1	DEC 2200	83 42	165 08	4	0.1	317.6
2	1900	83 41	164 40	4	0.4	318.9
3	2000	83 41	164 12	4	0.3	319.9
4	1900	83 41	163 58	5	0.7	320.4
6	1900	83 37	164 44	5	0.3	320.1
7	2000	83 42	164 55	5	0.2	320.5
8	2000	83 45	164 36	4	0.3	321.0
9	2000	83 47	164 42	4	0.2	321.1
10	2000	83 48	164 55	4	0.4	321.6
11	2000	83 48	164 58	4	0.3	321.6
12	1900	83 50	165 04	4	0.2	322.3
13	2000	83 48	165 08	4	0.3	322.0
14	2000	83 48	165 02	3	0.2	322.8
15	1900	83 42	164 02	4	0.4	323.7
16	2100	83 36	163 27	4	0.4	324.9
17	2000	83 32	163 07	4	0.4	325.6

DATE (1957)	TIME (GMT)	LATITUDE (NORTH)	LONGITUDE (WEST)	LINE OF POSITION	ERROR (MILES)	AZIMUTH (DEGREES)
18	DEC 1900	83 31	162 57	4	0.4	325.7
19	2000	83 33	162 46	4	0.4	326.4
20	1900	83 34	162 23	3	0.2	327.4
21	2400	83 35	161 53	4	0.3	328.5
22	2200	83 38	161 46	4	0.2	329.2
23	2200	83 39	161 44	4	0.6	329.5
24	2000	83 39	161 34	4	0.3	329.4
26	1900	83 38	161 42	4	0.5	329.3
27	2000	83 38	161 33	4	0.6*	329.5
28	1900	83 38	161 37	4	0.3	329.9
29	2200	83 37	161 46	4	0.8	329.6
30	2200	83 37	161 45	4	0.6	329.5
31	1900	83 37	161 45	4	0.2	329.4
1958						
1	JAN 2200	83 39	161 30	4	0.4	329.3
2	2200	83 40	161 28	3	0.7	329.3
3	2000	83 40	161 16	4	0.4	328.4
4	2100	83 44	160 32	3	0.2	328.3
5	2200	83 44	160 47	3	0.1	328.9
6	2000	83 45	160 16	4	0.5	329.3
7	1900	83 44	160 42	4	0.3	329.2
8	2400	83 36	159 33	4	0.3	331.1
9	2300	83 29	158 56	4	0.3	330.4
11	0300	83 15	159 00	3	0.5	330.8
11	2400	83 17	159 11	4	0.1	331.1
12	2200	83 14	159 18	4	0.3	331.7
13	2100	83 13	159 02	4	0.4	332.6
14	2000	83 14	158 30	4	0.8	333.7
16	2100	83 26	156 37	4	0.4	334.9
19	0200	83 31	156 50	4	0.5	333.8
20	0300	83 31	157 00	3	0.4	333.5
20	2300	83 29	156 57	4	0.1	334.7
21	2000	83 28	157 30	4	0.8	334.6
23	1900	83 22	158 27	4	0.3	333.7
24	1900	83 24	158 28	5	0.4	333.6
25	2100	83 25	158 16	4	0.4	334.2
26	2400	83 25	158 34	4	0.8	334.7
27	1900	83 24	158 22	3	0.1	334.9
28	1900	83 27	158 00	4	0.3	334.7
29	1900	83 25	157 44	5	0.4	335.6
30	2200	83 27	156 54	7	0.5	337.8
31	2000	83 26	156 37	4	0.5	337.8
1	FEB 2000	83 27	156 22	4	0.6	339.4
2	2200	83 29	156 21	4	0.4	339.9
3	2000	83 31	156 35	4	0.1	340.0
5	1900	83 43	157 42	6	0.1	338.0
6	1900	83 43	157 45	4	0.2	337.6
7	1900	83 42	157 30	4	0.1	338.6
8	1900	83 45	157 34	4	0.4	339.2
9	2300	83 46	157 21	5	0.4	339.3
10	1900	83 45	157 03	4	0.2	339.7
12	0400	83 44	156 02	3	0.9	341.0
12	1900	83 46	155 28	4	0.3	341.2
13	1900	83 46	155 25	4	0.2	341.2
14	2000	83 45	155 28	4	0.3	341.5
15	2000	83 44	155 07	4	0.2	341.9
18	1900	83 46	155 05	4	0.5	341.6
19	1900	83 45	154 59	3	0.3	341.5
20	1900	83 46	154 59	3	0.5	341.7

	DATE (1958)	TIME (GMT)	LATITUDE (NORTH)	LONGITUDE (WEST)	LINE OF POSITION	ERROR (MILES)	AZIMUTH (DEGREES)
21	FEB	1900	83 46	155 17	4	0.2	341.0
23		0500	83 46	155 10	3	0.1	341.7
24		0600	83 44	154 59	4	0.5	341.5
26		0300	83 42	154 24	4	0.1	341.2
28		0300	83 41	154 04	4	0.5	342.9
1	MAR	0300	83 37	154 10	4	0.3	342.6
2		0300	83 32	154 15	4	0.2	342.3
3		0600	83 30	154 16	2	-	341.4
4		0300	83 31	154 29	4	0.2	341.5
5		0300	83 33	154 27	4	0.1	341.8
6		0300	83 34	154 13	3	0.4	343.0
8		0300	83 38	154 03	4	0.3	344.6
9		0700	83 41	154 16	4	0.1	346.7
10		0700	83 45	153 53	4	0.3	348.9
11		0700	83 45	153 58	4	0.3	349.4
12		0600	83 45	153 50	5	0.5	350.1
13		0700	83 45	154 08	4	0.2	349.7
14		0700	83 45	153 54	4	0.2	350.4
15		0700	83 43	153 53	4	0.2	350.5
17		0700	83 38	153 58	3	0.4	350.6
18		0800	83 36	153 39	4	0.2	351.3
19		1000	83 35	153 37	4	0.2	351.5
21		1000	83 47	153 22	4	0.2	352.0
22		0800	83 53	153 38	4	0.8	352.2
23		1000	83 50	153 33	5	0.2	352.7
24		0900	83 49	153 48	4	0.2	352.8
25		1000	83 46	153 44	4	0.1	353.0
26		0900	83 47	153 11	4	0.5	353.6
27		0900	83 48	152 49	4	0.2	353.1
28		1000	83 48	152 36	1	-	-
28		2300	83 48	152 20	2	-	353.4
30		2300	83 49	152 20	2	-	354.4
31		0900	83 48	152 38	5	0.9	354.1
1	APR	0900	83 48	152 50	4	0.1	353.8
2		0900	83 48	152 33	4	0.2	354.2
3		0900	83 48	152 27	4	0.5	354.1
4		0900	83 48	152 21	5	0.6	354.1
5		1000	83 50	152 30	3	0.1	354.2
6		2200	83 48	152 27	2	-	354.6
7		1000	83 48	152 18	4	0.2	355.2
8		1000	83 46	152 29	4	0.3	355.3
9		1000	83 45	151 58	4	0.3	356.9
10		1000	83 46	151 48	4	0.2	357.3
11		1000	83 48	151 45	5	0.3	357.9
12		1000	83 50	151 54	4	0.2	358.9
13		1000	83 51	151 49	3	0.2	0.5
14		1000	83 53	151 58	4	0.2	0.3
15		1000	83 52	151 55	4	0.2	0.3
16		1000	83 52	151 55	4	0.1	0.5
17		1000	83 53	151 52	3	0.6	0.4
18		2200	83 53	NOON	1	-	0.0
19		1000	83 53	151 58	4	0.4	0.1
20		1400	83 56	152 05	3	0.1	359.4
21		1000	83 57	151 58	4	0.1	0.1
22		1000	83 58	152 00	4	0.8	0.5
23		1500	83 58	151 56	3	0.1	359.6
24		1400	83 58	151 53	4	0.1	358.9
25		1500	83 59	151 30	4	1.0	359.0
26		1100	83 59	151 37	4	0.5	358.1
28		2200	84 01	152 31	3	0.1	359.3
1	MAY	2200	83 54	152 40	3	0.7	357.8
2		2100	83 48	153 06	2	-	356.7
3		2200	83 42	153 20	DR, 1	-	356.6

DATE (1958)	TIME (GMT)	LATITUDE (NORTH)	LONGITUDE (WEST)	LINE OF POSITION	ERROR (MILES)	AZIMUTH (DEGREES)
4 MAY	2400	83 39	153 01	3	0.1	355.4
6	0200	83 47	153 20	3	1.1*	356.7
7	0400	83 46	153 28	3	0.1	357.2
7	2000	83 46	153 41	3	0.3	356.7
8	2000	83 47	153 38	3	0.1	356.1
9	2000	83 46	153 47	3	0.1	356.9
10	2200	83 44	153 23	3	0.3	356.6
11	2000	83 44	153 17	3	0.4*	357.1
12	2300	83 43	152 53	3	0.3	356.5
13	2000	83 44	152 44	3	0.5	357.0
14	2200	83 45	152 10	3	0.1	358.0
16	2000	83 47	152 32	3	0.3	358.6
17	1900	83 48	152 28	2	-	358.4

CAMP MOVED TO NEW FLOE (NEW REFERENCE LINE)

18	2200	83 50	151 57	3	0.4*	54.4
19	2300	83 49	152 01	3	0.2	54.4
21	2000	83 49	151 38	3	0.1	56.1
22	2100	83 51	151 28	3	0.3	56.9
23	2000	83 56	151 32	3	0.1	57.0
25	2300	83 56	151 37	3	0.1	56.6
26	2000	83 55	151 28	3	0.1	57.0
27	2000	83 56	151 12	3	0.1	57.8
29	2100	83 57	151 36	3	0.9	57.9
30	2100	83 58	152 06	3	0.9*	59.0
31	2300	83 56	151 33	3	1.6*	60.0
1 JUN	2100	83 54	151 14	3	0.5	61.2
2	1800	83 55	151 10	2	-	61.2
3	2100	83 57	151 27	3	0.1	61.7
4	0200	83 56	151 41	2	-	62.1
5	0300	83 55	152 00	2	-	62.3
5	1900	83 58	151 30	3	0.1	62.5
6	2100	84 02	151 20	2	-	63.2
7	2000	84 09	150 43	3	0.9*	63.5
8	2200	84 09	150 23	3	0.1	62.3
9	2000	84 10	149 47	3	0.2	62.8
10	2200	84 12	149 27	3	0.5	63.5
11	2000	84 14	149 20	3	0.4	62.3
12	2000	84 16	149 11	3	0.1	51.6
13	2000	84 19	149 01	4	0.1	51.0
14	1000	84 21	148 56	2	-	50.9
14	2200	84 23	148 51	4	0.1	-
15	2200	84 23	148 37	4	0.2	51.2
16	2100	84 28	148 28	3	0.3	50.9
17	1900	84 31	147 59	3	0.1	51.2
18	2000	84 33	147 42	3	0.2	52.5
19	2300	84 33	148 07	4	0.3	52.4
21	0300	84 33	147 42	3	0.2	53.0
22	0100	84 35	147 37	3	0.2	52.8
24	0300	84 38	147 33	5	0.2	54.0
24	2300	84 39	147 38	3	0.2	54.7
25	2000	84 37	147 34	3	0.3	57.7
26	1900	84 35	147 49	2	-	57.2
29	0300	84 37	147 44	3	0.2	56.8
30	2300	84 41	147 51	3	0.1	55.7
1 JUL	2000	84 41	147 35	3	0.1	56.0
3	0000	84 41	147 21	3	0.1	56.4
3	2100	84 41	147 09	3	0.1	56.9
4	2200	84 40	147 15	3	0.1	57.1
5	2300	84 38	146 54	4	0.3	57.2
6	2200	84 35	146 37	3	0.4	57.4
8	0100	84 32	146 12	3	0.1	60.0

DATE (1958)	TIME (GMT)	LATITUDE (NORTH)	LONGITUDE (WEST)	LINES OF POSITION	ERROR (MILES)	AZIMUTH (DEGREES)
8 JUL	2000	84 32	146 04	3	0.1	61.5
10	0700	84 31	144 47	3	0.3	62.4
10	2200	84 31	144 28	4	0.4	63.4
13	0200	84 32	142 36	3	0.7*	62.1
14	0200	84 32	142 32	3	0.3	61.7
14	2200	84 33	142 25	3	0.5	61.8
15	2300	84 32	143 28	3	0.6	58.7
16	2200	84 33	144 03	3	0.6	59.6
18	0300	84 33	143 45	3	0.1	60.7
18	2300	84 33	143 29	3	0.1	61.9
21	0200	84 36	143 21	2	-	60.1
23	1300	84 41	140 26	2	-	73.8
24	0100	84 44	140 11	3	0.4	74.5
24	2100	84 47	140 03	3	0.8	76.8
25	2300	84 49	140 04	3	0.2	76.9
1 AUG	1200	85 02	138 00	4	0.2	84.5
2	0400	85 01	137 41	5	0.9	84.8
4	0000	85 02	138 12	3	0.3	85.6
4	2100	85 04	138 48	3	0.2	86.7
6	1900	85 02	138 58	3	0.2	86.9
7	2100	85 02	138 18	3	0.2	86.9
9	2100	85 00	136 45	4	0.4	87.3
11	0100	84 58	136 05	3	0.6	88.4
18	0600	85 03	135 03	3	0.2	85.5
18	2100	85 03	135 05	3	0.3	85.0
20	0300	85 02	134 00	3	-	82.7
20	2100	85 00	133 54	3	-	83.7
21	2300	84 59	133 26	4	-	84.4
26	0100	85 05	130 40	5	-	90.1
26	2100	85 05	130 23	3	-	88.6
27	1800	85 06	130 04	2	-	89.8
3 SEP	0000	85 27	128 16	2	-	94.1
3	2300	85 32	127 52	2	-	95.4
5	1500	85 41	127 17	2	-	96.4
9	0100	85 54	124 00	4	0.2	99.3
9	2200	85 55	123 34	4	0.4	101.1
12	2100	85 50	122 00	3	0.3	124.6
15	1900	85 56	122 35	3	0.2	123.7
17	2100	85 52	123 31	3	0.2	102.3
18	1900	85 52	122 47	2	-	76.4
23	0800	85 48	120 29	3	0.3	87.2
26	0800	85 49	119 45	4	0.4	86.8
2 OCT	2200	85 39	120 40	4	0.2	84.0
3	0500	85 40	120 31	3	0.3	83.8
3	2230	85 39	120 05	3	0.3	83.6
4	0830	85 41	119 55	4	0.5	83.8
7	1100	85 53	120 25	3	0.1	86.3
8	0300	85 53	120 21	4	0.2	86.4
11	0700	85 57	119 29	5	0.1	86.5
14	0700	86 03	119 30	5	0.1	85.6
15	0600	86 03	119 52	5	0.2	86.0
20	0700	86 09	121 28	4	0.3	88.6
21	2000	86 15	122 10	4	0.3	98.3
22	0800	86 20	121 32	3	0.2	99.8
26	2000	86 23	116 37	4	0.3	112.3
28	0800	86 21	116 10	3	0.2	112.2
1 NOV	0200	86 10	114 08	4	0.5	113.2
3	0500	86 12	113 08	3	0.4	112.6

2.2 T-3 (Bravo) Positions

Navigational procedures at T-3 were similar to those of the other stations, although a greater number of observers sometimes caused questionable results as new navigators were gaining experience. Many of the T-3 positions have been "corrected" by advancing or regressing LOP's to a common time on the basis of wind and current data. The "ERROR" listed is based on the triangle formed by the shifted LOP's.

During the summers of 1957 and 1958 an engineer's transit (vernier least count of 0.5 min) was the only instrument available for navigational purposes. Either a Wild T-1 or T-2 theodolite was in use during the remainder of the occupation. Position determinations could not be made from 17 December 1957 to 23 January 1958 because the theodolite had been poorly winterized. From 21 December 1958 to 14 April 1959 reference line azimuths were not obtained by the usual method because of a cracked prism in the horizontal optical system. However, a few azimuths were determined from the passage of single celestial bodies across the line of sight established by the reference line itself.

As the instruments were not placed on piers frozen into the ice during the summers of 1958 and 1959 the accuracy of the results from those summers was affected by differential settling of the tripod legs. Changes in the index errors of the vertical circles, which were not determined in the field during these periods, also influenced the validity of the basic data. D. Plouff¹³ (Keller, et al, in preparation) of the U. S. Geological Survey obtained a close approximation of those effects by comparing the measured changes of the altitude of the sun with the calculated changes over the time intervals between direct and reversed readings. The tabulated values which are listed after the other T-3 locations, include these corrections and an estimated error in minutes of arc-distance rather than as radii of circle as has been done for all other locations.

EXPLANATION OF TABLES

Same as for the preceding stations with the following exceptions:

<u>TIME</u>	Given to the nearest 15 minutes
<u>LONGITUDE</u>	Given to the nearest 5' for locations north of 75° North; to the nearest 1' south of 75° North
<u>AZIMUTH</u>	Is tabulated separately for several periods in 1959 and 1960 when the high angular velocity of the ice island made it advisable to calculate azimuth orientations for each sun shot, rather than from the mean of several. The estimated error does not exceed 0.5°.
*	Indicates positions derived from advancing or regressing LOP's to a common time.
(1)	Indicates supplementary azimuths obtained from a magnetic compass during overcast periods.

DATE (1957)	TIME (GMT)	LATITUDE (NORTH)	LONGITUDE (WEST)	LINE OF POSITION	ERROR (MILES)	AZIMUTH (DEGREES)
22 MAR	1715	82 49	97 10	2	--	324.0
26	1730	82 50	95 45	2	--	--
31	1830	82 48	96 15	3	0.1	--
5 APR	1815	82 50	96 00	3	0.3	--
11	1845	82 48	96 10	3	0.1	--
16	2015	82 50	96 20	3	0.8	--
21	1830	82 50	96 20	3	0.2	325.8
24	2115	82 50	96 00	3	0.1	--
29	1830	82 49	96 15	3	0.8	--
3 MAY	2000	82 50	96 00	3	0.9	--
8	1745	82 49	96 20	3	0.1	--
13	1815	82 49	96 10	2	--	--
19	1745	82 51	96 00	3	0.1	--
27	1815	82 50	96 05	3	0.1	--
3 JUN	1615	82 49	96 00	4	0.1	--
7	1630	82 50	96 15	2	--	328.4
8	1615	82 48	97 05	2	--	327.4
11 *	1530	82 44	97 10	2	--	326.6
13 *	1715	82 40	99 10	3	0.1	326.4
14	1345	82 38	99 40	2	--	326.6
15 *	1530	82 36	100 00	3	0.1	327.0
16	1400	82 35	100 10	2	--	327.2
17	1600	82 32	100 00	3	0.0	326.5
18	1645	82 31	99 55	4	0.1	326.6
19	1530	82 32	100 05	3	0.8	326.8
21	1945	82 31	99 35	2	--	327.4
23	1730	82 31	100 10	3	0.1	328.0
26	1845	82 31	100 25	3	0.1	327.2
27	1645	82 38	100 05	3	0.6	330.1
28	1930	82 28	100 15	3	0.2	331.2
29	1630	82 24	100 20	3	0.2	332.2
30 *	2000	82 23	100 40	3	0.5	--
1 JUL*	1715	82 21	100 50	3	0.4	331.7
3	2015	82 20	101 10	3	0.1	330.4
4 *	1915	82 16	101 10	2	--	333.9
6 *	2130	82 13	101 20	3	0.2	334.4
7	1945	82 09	101 20	2	0.0	333.8
8	1915	82 13	101 50	2	--	326.6
10	1715	82 11	101 45	3	0.0	326.6
12	1700	82 09	102 10	3	0.2	--
13	1800	82 04	102 20	3	0.1	328.7
14	1715	82 03	102 30	3	0.3	328.6
15 *	1715	82 02	102 25	3	0.1	329.0
16 *	1700	82 02	102 20	3	0.2	328.6
17 *	1830	82 02	102 20	3	0.1	--
18	1930	82 02	102 15	3	0.1	328.7
19	2045	82 02	102 05	3	0.3	329.5
24	1445	82 04	101 50	2	--	331.0
25 *	1730	82 06	101 50	3	0.2	331.4
27	1530	82 08	101 35	2	--	333.6
3 AUG	1900	82 11	101 10	3	0.0	335.2
4	1815	82 11	101 10	3	0.0	336.1
5	1715	82 12	101 05	3	0.2	337.2
6 *	1915	82 12	101 10	3	0.9	--
10	1600	82 10	101 35	3	0.0	333.8
13	1400	82 12	101 15	2	--	333.0
14	1445	82 12	101 20	3	0.4	332.6
16 *	1945	82 10	101 20	3	0.5	331.6
17 *	1645	82 10	101 25	3	0.2	331.8
18 *	1730	82 15	101 20	3	0.0	331.9
19	1545	82 13	101 20	1	--	--
20	2115	82 13	101 20	1	--	--
22 *	1930	82 11	101 20	3	0.1	332.4

DATE (1957)	TIME (GMT)	LATITUDE (NORTH)	LONGITUDE (WEST)	LINE OF POSITION	ERROR (MILES)	AZIMUTH (DEGREES)
25 AUG	2115	82 13	100 30	1	--	--
27	2130	82 16	99 25	3	1.0	333.1
30 *	2030	82 20	98 40	3	0.0	336.3
31	2100	82 23	98 10	1	--	--
1 SEP	2100	82 24	98 05	3	0.0	--
4	1915	82 24	98 05	3	0.0	346.8
7 *	2000	82 26	97 40	3	0.4	344.6
8	1915	82 23	98 20	3	0.2	344.8
9	1700	82 18	98 15	3	0.2	--
12	0015	82 19	99 15	5	0.1	--
13 *	2045	82 16	99 50	3	0.1	343.9
14	1615	82 15	100 45	3	0.7	342.9
15 *	1715	82 06	101 05	2	--	--
18	1530	82 05	104 15	4	0.2	340.7
21	0630	82 03	104 05	3	0.1	343.5
22	0615	81 59	104 25	2	--	344.3
27	--	82 07	104 25	--	--	--
4 OCT	--	81 37	106 15	--	--	--
7	--	81 25	108 20	--	--	--
12	0715	81 41	106 40	4	0.1	--
13	1815	81 39	106 35	3	0.1	--
14	2045	81 40	106 40	3	0.1	--
16	0945	81 39	106 50	3	0.2	--
17	0545	81 39	106 50	3	0.4	--
20	1645	81 19	108 10	2	--	--
23	0700	81 16	107 25	3	0.0	347.9
24	1400	81 16	107 25	3	0.5	--
26	0745	81 14	108 00	3	0.2	--
27	0000	81 13	107 55	3	0.8	--
30	0630	81 07	107 55	3	0.5	349.6
31	1500	81 08	107 50	3	0.3	349.1
2 NOV	0615	81 08	108 05	3	0.5	--
3	0945	81 07	108 25	3	0.5	348.4
5	0730	81 00	109 05	3	0.1	349.3
10	0015	80 50	109 45	3	0.2	348.4
12	0700	80 50	109 45	3	0.7	348.4
13	0400	80 50	109 40	3	0.5	348.4
14	2015	80 50	109 40	3	0.5	348.5
15	1800	80 50	109 45	3	0.0	348.5
16	1845	80 51	109 40	3	0.5	348.6
17	1300	80 51	109 45	3	0.1	348.5
19	0815	80 45	109 55	3	0.2	348.0
20	0515	80 50	109 40	3	0.6	--
21	1530	80 51	109 45	3	0.2	347.5
23	0515	80 47	110 00	3	0.3	346.3
23	2200	80 45	110 25	3	0.0	345.6
28	0315	80 31	111 55	3	0.3	342.2
4 DEC	--	80 20	114 40	--	--	--
7	--	80 16	114 45	--	--	--
16	--	80 19	113 30	--	--	--
1958						
24 JAN	1645	80 39	112 20	3	0.1	--
25	1400	80 41	112 10	3	0.1	--
27	1845	80 41	112 40	3	0.5	338.1
28	1630	80 39	112 55	3	0.6	337.9
31	1800	80 19	113 10	3	0.7	338.5
1 FEB	2115	80 17	113 10	3	0.2	338.5
2	2130	80 18	113 15	3	0.5	338.4
4	2100	80 18	113 25	3	0.1	338.9
6	1500	80 26	112 55	4	0.2	339.4
7	1600	80 24	112 55	3	0.4	339.2
8	2300	80 23	112 55	3	0.2	339.3

DATE (1958)	TIME (GMT)	LATITUDE (NORTH)	LONGITUDE (WEST) °	LINE OF POSITION	ERROR (MILES)	AZIMUTH (DEGREES)
9 FEB	1700	80 24	112 50	3	0.1	339.9
13	0015	80 22	112 45	3	0.8	339.8
15	1330	80 22	112 45	3	0.5	339.6
17	0145	80 22	112 50	3	0.1	339.6
18	0130	80 21	112 45	3	0.2	339.6
19	1315	80 22	112 40	4	0.3	339.5
21	1315	80 22	112 40	3	0.3	339.5
5 MAR	0300	80 21	112 50	3	0.1	--
7	0345	80 21	112 50	3	0.0	339.3
9	0415	80 21	112 50	3	0.2	339.3
13	0345	80 20	113 05	3	0.1	339.0
16	0400	80 19	112 55	3	0.1	339.6
18	0515	80 16	113 05	3	0.1	338.2
21	0545	80 18	112 55	3	0.1	340.7
24	0545	80 18	113 10	2	--	340.1
26	0515	80 17	113 05	3	0.3	--
28	0600	80 18	112 55	3	0.1	341.1
30	0615	80 17	113 00	3	0.2	341.0
3 APR	0745	80 17	113 15	3	0.0	340.7
7	1930	80 19	113 05	3	0.5	341.3
9	2000	80 17	112 55	3	0.3	341.3
11	1930	80 18	113 00	3	0.2	341.1
14	1900	80 17	113 05	3	0.2	340.9
16	1930	80 18	112 45	3	0.3	341.2
17	1930	80 18	113 10	3	0.2	340.7
20	1900	80 18	113 00	3	0.2	340.9
22	2000	80 17	112 55	3	0.3	341.0
24	1930	80 18	113 05	3	0.2	340.9
26	2030	80 18	112 50	3	0.2	341.0
28	2015	80 19	113 10	3	0.1	341.2
30	1945	80 19	113 20	3	0.1	340.8
3 MAY	1730	80 16	113 55	3	0.0	339.0
4	1815	80 16	114 00	3	0.4	--
6	1715	80 18	113 50	3	0.0	338.6
9	1800	80 15	114 45	3	0.4	340.2
11	1815	80 01	116 15	3	0.4	339.9
13	2030	79 54	116 05	3	1.0	340.4
19	2015	80 01	115 50	3	0.3	340.3
22	2000	79 58	115 45	3	0.7	340.5
24	2045	79 57	115 30	3	0.8	--
26	1730	79 58	115 40	3	0.0	340.4
30 OCT	0300	78 11	122 05	4	0.3	--
1 NOV	0530	78 10	121 55	3	0.0	--
4	0600	78 09	122 10	4	0.0	--
6	0315	78 04	122 20	3	0.0	--
7	0415	78 02	122 25	3	0.0	--
8	0230	78 03	122 30	3	0.3	--
9	0600	78 01	122 40	3	0.1	--
11	0715	77 58	122 55	3	0.0	--
12	0330	77 58	123 00	3	0.2	--
13	0415	77 57	122 55	3	0.1	0.5
14	0415	77 55	122 55	3	0.2	--
16	0515	77 45	123 05	3	0.2	--
17	0230	77 45	123 05	3	0.2	--
18	0300	77 43	122 55	3	0.3	359.6
20	0400	77 35	123 10	3	0.2	--
22	0300	77 31	123 15	3	0.4	--
23	0600	77 30	123 10	3	0.3	--
26	0030	77 19	123 30	3	0.2	--
27	0130	77 13	123 35	3	0.2	358.9
28	0600	77 10	123 25	3	0.3	--
29	0315	77 04	123 40	3	0.3	--

DATE (1958)	TIME (GMT)	LATITUDE (NORTH)	LONGITUDE (WEST)	LINE OF POSITION	ERROR (MILES)	AZIMUTH (DEGREES)
1 DEC	0715	76 50	124 10	3	0.3	--
2	2145	76 39	124 15	3	0.2	-- 0.4
4	0300	76 31	124 25	3	0.3	--
4	2245	76 28	124 30	3	0.1	--
6	0000	76 27	124 20	3	0.1	--
7	0815	76 26	124 20	3	0.1	-- 3.9
8	0500	76 19	124 35	3	0.2	-- 4.1
8	2345	76 14	125 00	3	0.2	-- 4.1
9	2245	76 07	125 30	3	0.2	-- 4.8
11	0000	76 02	125 20	3	0.1	--
13	0315	75 48	125 40	3	0.0	-- 6.8
13	2115	75 41	125 45	3	0.3	-- 8.0
14	0615	75 40	125 50	3	0.2	--
14	1500	75 40	125 45	3	0.3	--
14	2345	75 36	125 50	3	0.2	--
15	0330	75 35	125 50	3	0.1	--
16	0315	75 31	125 55	3	0.2	-- 8.2
17	0230	75 26	126 10	3	0.2	-- 8.2
18	0445	75 25	126 25	3	0.1	--
18	2330	75 24	126 15	3	0.2	-- 8.0
21	0345	75 17	126 20	3	0.0	--
21	2345	75 15	126 20	3	0.4	--
25	0015	75 21	126 55	3	0.2	--
27	1700	75 23	126 50	3	0.2	--
28	0315	75 23	126 50	3	0.2	--
29	0700	75 22	126 35	3	0.3	--
30	0230	75 24	126 35	3	0.2	--

1959

1 JAN	0230	75 20	126 20	3	0.0	--
2	0400	75 19	126 15	3	0.3	--
3	0200	75 16	126 15	3	0.0	--
3	2115	75 13	126 20	3	0.1	--
6	0830	75 10	127 05	3	0.2	--
7	0215	75 08	127 30	3	0.0	--
7	2300	75 05	127 50	3	0.0	--
9	0500	75 02	127 55	3	0.2	--
10	0330	75 00	128 00	3	0.2	--
11	0245	74 58	128 07	3	0.4	--
12	0400	74 56	128 10	3	0.3	--
13	0000	74 53	128 12	3	0.2	--
14	0230	74 49	128 12	3	0.3	--
15	0315	74 49	128 12	3	0.0	--
16	1130	74 49	128 11	3	0.2	--
17	0015	74 50	128 14	3	0.3	--
18	0215	74 49	128 15	3	0.1	--
20	0230	74 46	128 09	3	0.1	--
22	0300	74 36	128 16	3	0.1	--
25	0500	74 31	128 22	3	0.0	--
27	0315	74 28	128 06	3	0.0	-- 6.1
28	0500	74 28	128 13	3	0.1	--
29	0630	74 28	128 08	3	0.1	--
30	0515	74 30	128 11	3	0.2	--
31	0230	74 29	128 08	3	0.1	--
1 FEB	0715	74 23	128 17	3	0.2	--
3	0200	74 17	128 18	3	0.2	--
6	0500	74 10	128 24	3	0.4	--
7	0245	74 09	128 23	3	0.3	-- 6.7
8	0745	74 09	128 24	3	0.3	--
9	0530	74 09	128 25	3	0.2	--
12	0430	74 07	128 30	3	0.3	--
13	0230	74 07	128 32	3	0.3	--

DATE (1959)	TIME (GMT)	LATITUDE (NORTH)	LONGITUDE (WEST)	LINE OF POSITION	ERROR (MILES)	AZIMUTH (DEGREES)
16 FEB	0430	74 07	128 26	3	0.2	--
18	0245	74 09	128 30	3	0.3	8.1
21	0730	74 12	128 35	3	0.0	--
23	0630	74 07	128 28	3	0.2	--
24	0400	74 07	128 18	3	0.0	--
25	0545	74 06	128 19	3	0.4	--
26	0500	74 05	128 20	3	0.4	--
27	0515	74 05	128 20	3	0.1	--
1 MAR	0800	74 06	128 21	3	0.3	--
2	0430	74 05	128 18	3	0.3	--
4	0815	74 05	128 22	3	0.3	--
7	0530	74 05	128 19	3	0.4	--
9	0445	74 05	128 19	3	1.3	--
10	0730	74 05	128 21	3	0.2	--
11	0545	74 05	128 18	3	0.2	--
12	0600	74 06	128 16	3	0.0	--
13	0700	74 05	128 19	3	0.2	--
15	0630	74 05	128 18	3	0.2	--
16	0615	74 05	128 21	3	0.2	--
17	0615	74 05	128 22	3	0.2	--
18	0600	74 06	128 21	3	0.4	--
19	0730	74 05	128 22	3	0.2	--
20	0515	74 05	128 22	3	0.4	--
21	0645	74 05	128 20	3	0.5	--
23	0700	74 05	128 24	3	0.2	--
24	0600	74 05	128 20	3	0.2	--
26	0615	74 05	128 23	3	0.3	--
27	0645	74 05	128 22	3	0.4	--
29	0630	74 06	128 23	3	0.2	--
1 APR	0700	74 05	128 22	3	0.0	9.0
2	0645	74 05	128 22	3	0.2	--
3	0715	74 06	128 28	3	0.3	--
4	0715	74 05	128 46	3	0.0	--
5	0830	74 05	128 52	3	0.0	--
6	0830	74 05	128 54	3	0.0	--
8	0730	74 05	128 50	3	0.2	--
13	0800	73 56	129 07	3	0.1	--
14	0800	73 55	129 02	3	0.1	--
15	0730	73 56	129 00	3	0.2	--
16	0815	73 54	129 02	3	0.2	--
18	0800	73 53	129 05	3	0.3	--
21	0830	73 43	129 18	3	0.0	--
22	0845	73 44	129 19	3	0.2	--
26	0915	73 40	129 28	3	0.1	--
4 SEP	2115	71 31	136 20	2	--	--
7	0015	71 33	137 01	3	0.1	--
7	2145	71 37	137 15	3	0.2	--
10	0000	71 41	136 48	2	--	--
11	2230	71 39	136 38	3	0.5	--
12	2015	71 36	136 26	3	0.6	313
13	2215	71 37	136 21	3	0.7	331
14	0900	71 36	136 20	3	0.1	333
16	2045	71 37	136 22	3	0.4	--
17	2045	71 37	136 14	3	0.4	--
20	2300	71 38	136 28	2	--	--
25	2000	71 20	137 13	3	0.3	--
28	2030	71 11	137 44	3	0.3	--
5 OCT	2000	71 38	138 09	3	0.6	--
6	2045	71 38	138 11	3	0.5	--
10	2045	71 37	138 25	3	0.8	--
14	0930	71 39	139 02	3	0.3	--
15	0915	71 35	139 08	3	0.6	206.7
17	0630	71 37	138 56	3	0.2	206.8

DATE (1959)	TIME (GMT)	LATITUDE (NORTH)	LONGITUDE (WEST)	LINE OF POSITION	ERROR (MILES)	AZIMUTH (DEGREES)
19 OCT	0645	71 34	138 46	3	0.3	192.7
21	0715	71 30	138 54	3	0.0	196.5
23	0615	71 31	139 21	3	0.1	195.9
28	0430	71 28	139 38	3	0.5	194.8
29	0600	71 27	139 49	3	0.1	194.1
31	0500	71 18	140 06	3	0.0	195.0
3 NOV	0515	71 15	141 00	3	0.0	198.3
5	0530	71 10	141 05	3	0.4	200.7
6	0515	71 08	141 10	3	0.2	201.1
8	0430	71 09	141 22	3	0.3	200.0
10	0430	71 05	141 18	3	0.3	--
13	0515	71 04	141 32	3	0.4	202.9
14	0430	71 02	141 49	3	0.3	205.7
17	0730	71 01	142 56	3	0.0	218.0
19	0400	71 09	144 00	3	0.2	233.4
20	0430	71 10	144 17	3	0.3	237.0
22	0345	71 09	144 20	3	0.4	235.3
24	0415	71 09	144 20	3	0.2	235.4
27	0615	71 08	144 23	3	0.5	235.0
3 DEC	0900	71 11	146 17	3	0.3	227.9
4	0430	71 11	146 16	3	0.5	227.9
11	0215	71 05	145 05	3	0.3	224.7
13	0230	71 05	145 03	3	0.4	224.6
15	0215	71 04	145 06	3	0.3	224.9
17	0215	71 04	145 04	3	0.4	224.9
21	0245	71 04	145 06	3	0.0	225.0
22	0630	71 05	145 05	2	--	--
27	0400	71 06	145 02	2	--	227
1960						
2 JAN	1100	71 02	144 55	3	0.4	227.2
11	0415	71 02	145 15	3	0.1	--
15	0430	71 01	145 15	3	0.4	226.1
20	0430	70 58	145 00	3	0.2	--
30	0730	71 01	145 27	3	0.4	227.5
5 FEB	0515	71 12	146 52	4	0.4	225.2
7	0615	71 23	148 12	4	0.3	225.3
9	0430	71 35	149 54	4	0.4	229.5
15	0530	71 34	150 08	4	0.4	227.2
18	0700	71 37	150 24	3	0.3	228.7
20	0500	71 55	151 44	4	0.4	230.5
22	0530	72 00	152 48	4	0.5	232.5
1 MAR	0515	72 12	152 30	4	0.2	239.3
6	0700	71 49	150 34	3	0.3	244.5
8	0700	71 47	150 30	4	0.5	244.0
12	0830	71 45	150 30	3	0.1	245.8
17	0800	71 46	150 33	3	0.0	245.6
22	0900	71 53	150 50	4	0.2	242.5
24	0900	72 00	151 54	3	0.0	244.4
25	1030	72 05	152 39	3	0.0	245.3
26	0945	72 09	153 16	4	0.0	245.8
27	0745	72 12	153 44	3	0.2	246.8
28	0815	72 14	153 58	4	0.1	248.3
29	0930	72 13	154 02	4	0.0	247.8
30	0945	72 11	154 02	4	0.0	247.6
31	0915	72 11	154 00	4	0.1	247.4
1 APR	0845	72 11	154 02	3	0.0	247.4
2	0830	72 12	154 01	4	0.0	247.3
3	0815	72 11	154 02	3	0.1	247.3
4	0845	72 11	154 02	4	0.1	247.3
5	0915	72 10	154 13	4	0.1	247.4
6	0900	72 09	154 32	4	0.0	248.3

DATE (1959)	TIME (GMT)	LATITUDE (NORTH)	LONGITUDE (WEST)	LINE OF POSITION	ERROR (MILES)	AZIMUTH (DEGREES)
7 APR	0830	72 09	154 55	3	0.0	250.5
8	0845	72 11	155 29	4	0.0	250.6
10	1030	72 08	156 23	3	0.0	252.7
11	0830	72 05	156 30	4	0.0	255.0
12	0915	72 01	156 43	5	0.0	258.6
13	0845	71 55	157 02	4	0.0	283.4
14	0945	71 51	157 22	3	0.0	331.3
15	1000	71 50	157 13	4	0.0	329.7
16	1115	71 48	157 13	6	0.1	328.2
18	0915	71 45	157 10	5	0.0	329.2
19	0900	71 44	157 14	4	0.0	329.5
21	1015	71 43	157 27	7	0.0	329.8
22	1030	71 43	157 26	4	0.0	329.3
23	0915	71 43	157 27	5	0.0	329.0
26	1100	71 37	157 31	4	0.0	330.2
27	0945	71 40	157 15	3	0.0	331.2
2 MAY	0045	71 48	158 38	3	0.0	330.7
2	1030	71 49	158 50	3	0.0	332.5
2	2345	71 51	158 58	2	--	331.7
3	1045	71 54	159 06	3	0.0	329.4
4	0200	71 54	159 17	3	0.1	--
4	1030	71 55	159 21	3	0.0	351.7
4	2045	71 55	159 24	3	0.0	--
5	0130	71 55	159 26	4	0.0	--
5	1045	71 55	159 29	4	0.0	11.2
5	2045	71 54	159 31	4	0.1	9.5
6	1015	71 54	159 37	4	0.0	9.7
6	2200	71 53	159 37	3	0.1	--
7	1045	71 53	159 37	4	0.0	13.6
8	0045	71 52	159 38	3	0.3	--
9	2330	71 52	159 33	4	0.0	24.3
10	1900	71 50	159 32	3	0.2	24.0
11	0300	71 50	159 30	3	0.1	24.0
11	1915	71 50	159 29	3	0.1	24.6
12	1945	71 50	159 38	2	0.0	--
15	0000	71 51	159 44	3	0.2	--
16	2245	71 51	159 40	5	0.2	28.9
17	2030	71 51	159 41	3	0.0	38.8
24	0700	71 50	160 21	3	0.0	--
26	2130	71 50	160 21	4	0.0	98.2
15 JUL	-----	71 50	160 21	-	--	98.2
16	2330	71 46	160 08	4	0.0	--
17	2145	71 47	160 09	3	0.3	--
18	0400	71 47	160 07	3	0.0	--
18	2015	71 48	160 05	3	0.0	90.9
19	2045	71 49	159 56	3	0.0	--
20	2215	71 50	159 45	5	0.2	--
21	2300	71 50	159 42	5	0.2	--
22	2245	71 50	159 45	4	0.0	--
23	2115	71 49	159 48	3	0.0	--
25	0015	71 49	159 50	4	0.0	--
25	2345	71 49	159 57	4	0.3	--
26	2045	71 50	160 11	3	0.0	--
27	2030	71 53	160 17	3	0.1	--
28	0115	71 53	160 20	3	0.0	--
28	2030	71 52	160 20	3	0.0	--
29	2200	71 52	160 20	4	0.0	98.7

DATE (1957)	TIME (GMT)	AZIMUTH (DEGREES)
27 MAY	1715	326.4
3 JUN	1430	327.4
12 JUL	1830	328.6
20	1815	330.4
6 AUG	1945	337.0
1 SEP	2015	345.2
9	1500	345.7
20 NOV	0545	348.2

1958

26 MAR	0615	340.6
24 MAY	2115	341.3
4 AUG	2300	344.0
6	2200	347.5
11	2030	348.0
14	2300	350.5
22	0030	357.5
24 SEP	2200	356.8
11 DEC	2215	5.8

1959

14 APR	2145	7.7
15	0015	7.6
15	1915	7.7
15	2315	7.6
17	1645	10.2
17	1945	10.6
18	1745	8.4 **
19	0130	7.7
20	1700	8.5
20	1945	8.5
20	2345	8.5
21	1745	8.5
21	2200	8.4
22	0030	8.5
22	1715	8.4
22	1930	8.4
23	0045	8.4
23	1815	8.7
23	2145	8.6
24	0015	8.6
24	1730	9.0
24	1930	9.1
24	2215	9.1
26	2030	9.8
26	2245	9.8
27	0015	9.7
27	1715	9.9
27	1915	9.8
2 MAY	1945	9.7
5	2145	10.7
6	0015	10.7
6	1715	10.8
6	1945	11.0
12	2215	12.3
13	0115	12.8
22	0400	17.1
24	1945	17.5
25	1615	17.9
28	1745	16.6

DATE (1959)	TIME (GMT)	AZIMUTH (DEGREES)
8 JUN	0015	16.7
15	2345	20.9
17	1730	19.3
19	2145	23.7
23	2145	27.9
25	1715	30.5
2 JUL	2215	36.1
3	0100	36.0
6	0315	35.3
8	2345	40.5 **
9	0230	37.1
11	0200	40.4
14	2315	38.2
15	2015	40.2
15	2300	40.5
18	2015	50.0
18	2230	49.9
20	2215	62.4
21	2345	66.9
22	0200	66.7
24	0045	77.3
26	2245	104.8
28	1815	114.4
30	2215	143.9
6 AUG	0215	219.2
6	1945	222.7
7	1845	221.4
7	2215	219.3
9	2145	245.7
9	2345	249.6
10	1845	263.3
10	2245	285.6
12	2200	337.6
13	0015	340.0
13	0215	342.3
13	1945	6.6
13	2245	10.7
14	0045	13.5
15	2230	100.0 **
16	0015	84.0 **
17	1845	125.5
17	2015	126.5
17	2245	128.8
19	1815	153.1
19	2015	153.1
22	0030	184.5 **
25	2000	174.9
27	2200	177.8
28	0230	187.2
29	1845	233.9
29	2315	240.1
7 SEP	2015	167
7	2115	168
8	0000	172
8	1845	200
9	2130	230
10	0215	236
11	1915	282
11	2200	285
11	2300	286
11	2315	286
12	0115	288

DATE (1959)	TIME (GMT)	AZIMUTH (DEGREES)
12 SEP	1830	310
12	2230	315
13	0000	316
14	0000	331
14	1830	337
14	2215	338
15	0845	338
16	1930	332
17	1930	317
17	2030	316
17	2200	315
18	1945	308
18	2130	306
18	2245	305
19	0000	305
20	2245	312
20	2330	312
21	1930	319
21	2030	320
22	1815	331
25	0930	46 **
25	1745	54
25	1930	58
25	2245	64
28	1800	137
28	2245	137
29	2100	124
5 OCT	1830	213
5	1945	212
5	2200	210
6	0945	204
6	1845	204
6	2000	204
6	2200	204
6	2245	205
9	2315	203
10	1900	203
10	2015	203
10	2145	202
10	2300	202
11	0645	202
1960		
25 JAN	0630	226.7
3 MAY	1815	321
3	2030	329
3	2300	329
4	0215	330
4	0445	336
4	1900	4
4	2030	8
4	2245	9
5	0100	12
5	0145	12
5	0400	16
5	1815	10
5	2300	9
6	0130	10
6	1730	10
6	2315	10
7	0130	10

DATE (1960)	TIME (GMT)	AZIMUTH (DEGREES)
7 MAY	1830	18
8	0315	23
8	0445	23
9	1900	24
9	2300	24
10	0100	24
10	0230	24
10	1700	24
10	1845	24
10	2100	24
10	2300	24
11	1730	25
11	2130	24
12	2015	25
14	2100	13
15	0445	17
15	1845	16
16	1745	27
17	0145	32
17	0430	35
17	1830	39
17	2015	40
19	0245	56 (1)
19	1015	66 (1)
19	1830	75 (1)
20	0700	91 (1)
20	2130	115
21	0300	124 (1)
21	1030	132 (1)
21	1830	146 (1)
21	1930	148 (1)
21	2045	149 (1)
22	0145	138 (1)
22	0815	123 (1)
22	1045	117 (1)
22	2215	100 (1)
23	0700	100 (1)
23	1045	99 (1)
24	0030	99
25	1830	98
25	2000	98
18 JUL	1815	92
18	2000	91
18	2215	91
19	1915	79
19	2030	77
20	1845	42
20	2030	39
20	2200	36
20	2245	35
21	0015	34
21	1900	25
21	2030	25
21	2215	25
22	0015	26
22	0045	25
22	1845	30
22	2015	32
22	2345	35
23	0415	40
23	1900	44
23	2015	44

DATE (1960)	TIME (GMT)	AZIMUTH (DEGREES)
23 JUL	2215	43
24	2145	57
24	2330	59
25	0100	60
25	0245	63
25	2045	78
25	2300	78
26	0100	78
26	0200	79
26	1930	91
26	2215	92

DATE (1958)	TIME (GMT)	LATITUDE (NORTH)	ERROR (MIN)	LONGITUDE (WEST)	ERROR (MIN)	LINE OF POSITION	AZIMUTH (DEGREES)
2 JUN	1845	79 53	0.5	115 25		3	
3	1230	79 53	0.5	115 25		3	
4 *	1945	79 51	1.0	115 00		3	
6	1745	79 48		115 30		2	
10	1815	79 44	1.0	116 20	3	2	
11 *	0945	79 44	0.5	116 25	2	3	341.7
18 *	1645	79 46	0.5	116 15	3	3	341.9
25 *	2030	79 45	0.7	116 10	3	2	342.0
30	0515	79 43	3.0	116 20	10	3	341.0
6 JUL	2030	79 41	3.0	117 45	15	3	
9 *	2300	79 19	0.5	118 20	2	4	
13	1715	79 15	0.5	118 55		2	
14 *	1815	79 14	0.2	119 00	2	3	
18	0545	79 15	1.0	118 25	8	3	
22	0445	79 15	4.0	118 40	20	3	342.5
24	1645	79 15	3.0	118 50	4	2	
25	1945	79 13	1.0	119 00	5	3	341.8
28 *	2015	79 09	0.2	119 15	3	3	343.7
30	2000	79 05	2.0	119 40	7	3	347.0
4 AUG	0700	79 00	0.5	121 15		3	
6	1545	79 01		121 10	15	2	
7 *	0900	79 00	1.5	121 15	5	3	
8	1815	78 54	0.5	121 30		3	
10 *	0845	78 52	2.0	121 30	7	4	
11 *	1715	78 51	2.0	121 35	10	3	
12	2045	78 48	1.0	122 00	4	3	
14	2000	78 50	1.0	122 05	7	3	
15 *	1300	78 51	0.5	122 05	2	3	
20	1745	78 45		122 45		2	
21	1845	78 44	1.0	122 35	5	5	
22	2215	78 43	3.0	123 30	12	3	
1 SEP	2245	78 45	2.0	123 55	15	4	
5	0715	78 40		123 40		2	
12	1945	78 27	1.0	122 25	8	2	356.3
24	1845	78 26	0.5	122 10		2	

1959

27 APR	1830	73 43	0.5	129 20	3	2	
5 MAY	2300	73 39	2.0	129 19	4	2	
6	1830	73 39	1.0	129 22	26	2	
9	2015	73 34	1.3	129 27	5	3	
13	0000	73 33	3.7	129 40	3	2	
14	2130	73 35	0.3	129 45	0	2	
18	2030	73 34	0.2	130 03	1	3	
25	0000	73 13	5.0	130 18	7	4	
25	2000	73 07	0.2	130 32	0	3	
27	2145	73 00	3.7	130 24	8	2	
28	2315	72 56	0.5	130 20	0	3	
31	2145	72 41	1.0	130 16	5	3	
3 JUN	2145	72 34	2.0	130 10	6	3	
5	1800	72 28	0.5	130 03	2	2	
8	0030	72 25	1.1	130 40	3	3	
10	2200	72 16	2.0	130 28	6	3	
13	1945	72 10	0.7	130 14	4	3	
15	2145	72 06	1.0	130 20	5	3	
16	2330	72 04	1.2	130 39	11	2	
17	1945	72 05	0.2	130 53	0	3	
20	0015	71 57	2.5	131 01	4	3	
23	1930	71 48	1.0	131 33	5	3	
25	1930	71 49	2.0	131 55	3	3	
26	2215	71 53	1.0	132 04	3	3	
29	0100	71 57	1.0	132 20	2	3	

DATE (1959)	TIME (GMT)	LATITUDE (NORTH)	ERROR (MIN)	LONGITUDE (WEST)	ERROR (MIN)	LINES OF POSITION	AZIMUTH (DEGREES)
30	1945	71 58	0.3	132 31	0	3	37.1
2	JUL 2300	71 58	0.5	132 32	2	4	
6	0100	71 52	0.0	132 23	0	3	
8	2315	71 57	0.5	132 31	0	3	
11	0145	71 54	0.5	132 29	0	3	
14	1930	71 38	0.5	132 34	3	2	
15	2045	71 35	0.5	132 39	2	3	
17	2045	71 38	0.0	132 50	0	2	
18	2245	71 40	4.0	133 09	3	3	
20	2100	71 41	0.5	133 20	4	2	
22	0000	71 37	0.5	133 13	2	3	
24	0030	71 36	4.0	133 15	7	3	
26	2330	71 27	2.7	133 34	4	2	
28	2015	71 26	1.1	133 23	6	3	116.4
31	0015	71 31	0.5	133 10	2	3	146.8
3	AUG 0030	71 26	1.0	133 33	3	2	
6	0845	71 23	0.7	134 24	2	3	
7	2030	71 16	0.3	134 40	3	3	
9	2245	71 10	0.5	134 16	2	2	
10	2000	71 10	1.0	134 20	13	3	
13	0000	71 05	1.5	134 03	2	3	
13	2215	71 08	0.5	134 11	2	3	
15	2230	71 12	0.2	134 28	0	3	
17	2030	71 17	0.2	134 45	0	3	
19	2030	71 26	0.2	135 01	0	3	
21	2230	71 27	0.2	135 11	0	3	
23	2345	71 24	2.0	135 17	0	3	
25	2115	71 24	0.2	135 34	0	2	
28	0015	71 20	0.8	135 18	2	3	
29	2045	71 23	0.2	135 36	0	3	

2.3 Charlie Positions

Navigation at Station Charlie was undertaken by University of Washington personnel during the entire drift, and concurrently by Lamont (Hunkins,¹¹ 1960) in the winter (15 November to 6 January 1960). Several inconsistencies between the two sets of data have been noted, but as information regarding estimated errors of the University of Washington locations is not available, no attempt has been made to resolve discrepancies. Both sets are tabulated in this report.

The following commentary and list of positions was furnished by the University of Washington:

- 1) Three lines of position were not always available for each date, in which case the nearest LOP in time was used to complete a triangle.
- 2) A 0.6' correction was applied in the calculation of true observed solar altitudes; this correction being necessary in the Table of the Nautical Almanac to take into account irradiation of the visible, or true, horizon, whereas our instrument, a theodolite, utilizes an artificial horizon. (See paragraph 16 Explanation of Nautical Almanac in Nautical Almanac).
- 3) An uncertainty present in the data was whether in regard to the sun and moon the upper or lower limb was actually shot. This confusion arose because two sets of eyepieces were employed, with one set inverting the field and the other not inverting the field. It is believed that in practically every case correct assumptions relative to the limbs have been made.
- 4) "The higher the temperature the more accurate the fixes" is suggested by the size of the fixing triangles.
- 5) More definite information is available on request in that most, but not all, data is contained in the tabulation.

An automatic radio sextant that could track the sun through a cloud cover was operated on an experimental basis at CHARLIE. Because of several mechanical defects and a lack of adequate weather-proofing the instrument functioned only intermittently, and derived angles often deviated to an impermissible degree from those obtained by optical methods. Occasionally, however, the instrument gave comparatively valid data and was quite useful during long periods of overcast.

EXPLANATION OF TABLES

University of Washington station positions are given on pages 41 and 42.

Lamont Geological Observatory positions, page 43.

* Indicates position dependent upon radiometric sextant angles.

DATE (1959)	TIME (GMT)	LATITUDE (NORTH)	LONGITUDE (WEST)	AZIMUTH (DEGREES)
2 JUN	2400	76 01	161 54	7.5
3	2400	75 56	161 48	5.7
5	1100	76 01	162 08	7.2
6	2200	76 16	161 20	7.8
8	0000	76 11	161 53	8.4
8	2000	76 14	161 54	9.6
12	0100	76 06	161 05	8.9
13	0300	76 19	160 45	
15	0800	76 23	160 20	9.1
16	2400	76 26	159 46	10.4
17	2300	76 25	159 45	
18	2200	76 36	160 55	10.7
20	2200	76 45	160 30	12.3
22	0500	76 40	160 38	12.7
23	0100	76 50	160 20	13.9
24	2100	76 51	160 55	15.7
25	2000	77 00	160 35	15.6
27	1900	77 02	159 39	14.9
29	0300	76 50	160 15	14.4
30	2100	77 05	159 50	14.8
2 JUN	2100	77 15	160 03	14.1
3	2000	77 17	160 15	12.3
4	2300	77 19	160 05	11.3
5	2300	77 21	159 53	4.5
8	2000	77 33	160 23	4.1
9	2100	77 37	160 31	7.2
10	2100	77 39	161 00	11.3
11	0500	77 25	161 35	11.6
12	1000	77 41	161 31	3.2
13	1600	78 02	161 30	4.4
17	0400	77 37	163 15	3.1
18	1200	77 41	162 35	4.7
19	1100	77 40	163 46	
20	2200	77 42	164 17	6.8
21	0100	77 41	164 04	4.5
23	1400	77 36	163 55	6.7
24	2400	76 54	162 24	5.5
25	1400	77 52	162 56	5.4
26	1700	77 52	163 50	5.3
28	2200	77 43	164 06	6.3
29	2200	77 41	162 25	6.2
31	2100	77 38	164 42	6.6
1 AUG	2100	77 50	163 25	8.3
2	2400	77 26	164 35	9.6
4	0100	77 06	163 57	10.9
6	1300	77 21	164 09	
7	2100	77 27	164 12	6.5
8	0100	77 25	163 31	9.7
9	1600	77 16	163 02	8.1
12	2100	77 05	162 35	9.0
14	1600	77 43	164 08	8.1
15	1000	77 42	164 20	9.2
16	1400	77 42	164 50	11.0
17	1500	77 48	165 57	11.8
18	1100	77 51	165 25	11.7
19	1600	77 50	165 58	12.4
20	1800	77 50	166 25	11.6
23	1000	77 51	166 53	11.6
24	0800	77 53	168 10	12.2
25	1300	77 53	168 45	13.1
27	0100	78 00	168 54	12.1
28	1000	77 49	168 57	12.1
29*	0600	77 55	167 39	
30*	1000	77 56	168 25	
31*	1000	77 56	169 25	14.3

DATE (1959)	TIME (GMT)	LATITUDE (NORTH)	LONGITUDE (WEST)	AZIMUTH (DEGREES)
1*SEP	0200	77 56	169 25	
2	2400	77 51	171 15	12.1
4	0900	77 33	174 35	11.9
5	1200	77 37	171 42	14.1
6	0300	77 44	172 01	14.6
9	2400	77 45	171 55	16.4
10	1100	77 55	172 17	13.6
13	2300	78 06	170 35	11.6
16	0300	78 05	170 27	13.1
18	0600	78 05	172 24	11.1
21	0900	77 56	172 02	6.8
22	0600	78 03	172 12	8.8
23	0700	77 53	172 48	9.1
25	2000	77 47	172 55	10.0
26	0800	77 43	172 56	10.5
27	1400	77 51	173 50	11.9
28	0800	77 43	173 20	13.2
29	2300	77 52	173 20	15.7
30	0800	77 52	173 33	17.3
1 OCT	0800	77 52	174 04	20.0
3	0900	77 56	174 17	25.8
8	0800	78 0	174 14	22.7
10	0900	78 04	173 44	23.3
13	0800	77 57	173 58	29
16	0800	77 50	172 30	32
20	0900	77 31	172 01	30
23	0700	77 43	169 58	30.7
26	0600	78 02	170 50	29.2
29	1600	77 52	171 47	29.2
31	1300	77 47	171 57	24.6
3 NOV	0500	77 31	172 09	27.4
5	1700	77 43	171 02	30.5
10	1000	77 32	171 40	33.0
12	2200	77 38	171 51	34.4
15	0930	77 51	172 11	36.8
16	2200	77 55	172 18	38.0
18	2000	77 51	172 15	40.4
21	0300	77 53	172 39	38.7
23	0900	77 51	172 36	41.2
24	2100	77 54	172 38	41.6
28	0800	77 37	172 01	44.9
30	0800	77 47	172 42	49.2
2 DEC	0500	77 37	173 00	53.5
6	2100	77 11	171 57	57.4
9	2100	76 59	171 27	56.4
11	2100	76 57	171 01	56.3
13	1940	76 57	170 19	56.6
15	2100	76 58	169 52	53.9
17	2100	77 04	169 07	55.4
19	2000	77 07	168 31	57.9
22	0230	77 13	168 12	60.1
24	0700	77 14	168 34	60.4
26	0500	77 14	167 50	60.0
27	2300	77 23	167 29	60.8
30	0800	77 20	167 47	59.8
1960				
1 JAN	0900	77 13	167 18	59.6
3	0900	77 10	167 43	61.0
5	0800	77 13	168 02	61.9
7	1800	76 48	169 20	62.6

DATE (1959)	TIME (GMT)	LATITUDE (NORTH)	LONGITUDE (WEST)	LINE OF POSITION	ERROR (MILES)	AZIMUTH (DEGREES)
26 OCT	1000	77 59.9	171 38	4	0.6	028
15 NOV	0800	77 52.6	172 12	4	0.8	036
16	0700	77 53.9	172 22	4	0.3	037
21	2000	77 49.8	172 33	3	0.1	040
24	0700	77 51.7	172 38	6	0.2	041
30	0600	77 38.2	172 22	3	0.2	049
1 DEC	0500	77 37.7	172 43	4	0.7	050
2	0400	77 38.0	173 02	4	0.5	053
3	0400	77 35.9	173 12	4	0.4	054
6	0000	77 18.7	171 53	3	0.1	057
7	0000	77 09.9	172 00	4	0.3	057
10	0500	76 58.1	171 25	4	0.2	055
11	0500	76 57.4	171 16	4	0.2	056
13	0500	76 55.6	170 36	4	0.4	055
15	1300	76 59.3	169 47	4	0.2	051
17	0400	77 02.2	169 18	3	0.1	054
18	0600	77 05.6	169 04	2	-	056
19	0600	77 08.3	168 37	4	0.3	056
22	0100	77 13.7	168 03	4	0.2	060
23	0400	77 17.2	168 25	2	-	061
24	1300	77 15.8	168 32	3	0.1	059
27	0600	77 21.8	167 46	4	0.3	060
28	0700	77 25.3	167 32	4	1.0	060
28	1300	77 25.0	167 30	4	0.1	059
29	1100	77 24.4	167 36	4	0.8	058
31	0400	77 17.7	167 47	4	0.2	058
1960						
2 JAN	0700	77 13.6	167 34	5	0.2	059
3	0400	77 11.8	167 44	4	0.1	059
4	0600	77 10.6	168 01	4	0.1	060
6	0400	77 04.9	168 38	4	0.1	061

3. BATHYMETRY

Bathymetric studies comprised an integral portion of the scientific programs at the U. S. drift stations. Although the areal coverage from such stations did not approach that possible from surface vessels or submarines, the results obtained were more inherently precise as to depths, ocean floor attitudes, and probably locations. Most of the sounding data were obtained as subsidiary information through seismic investigations of the sub-oceanic geology; however, a precision depth recorder (PDR) wrote a continuous depth profile along most of the CHARLIE track.

Seismic reflection measurements were made at all stations with portable exploration seismograph systems. Twelve geophones in various semipermanent configurations on the sea ice were used to detect the reflected energy. Right-angled T and L spreads permitted the calculation of the strike and dip of the ocean bottom. One-half pound TNT, or equivalent, normally produced sufficient energy to cause the oscillograph traces to break sharply upon the return of the reflection to the detector array. The low natural background noise level of the area permitted operation of the equipment at high gain and with little or no filtering. Explosive charges were detonated electrically (and the cap break recorded) at a depth of ten feet, slightly below the ice-water interface. Shooting at this depth maintained bubble pulse oscillations at permissible levels and periods, and prevented the formation of ice blocks which would have otherwise tended to plug the shot hole.

Dips and dip azimuths were determined from standard reflection formulae; straight-line ray paths were assumed. Corrections to the standard velocity of sound in sea water were made using pertinent temperature and salinity. Additional corrections were applied for instrumental and cap delays, ice thickness, and detector elevations. Depths tabulated represent the shortest straight-line distances to the nearest reflector. Dips and dip azimuths represent the attitudes of small portions of the ocean floor. The area of such a portion can be considered approximately 0.25 the area of triangle formed by the two-dimensional seismic detector arrays in use. High dip values ($>10^\circ$) obtained over rough bottom topography are probably atypical.

Orientations (referred to geographic North) and geographical positions of the seismic arrays were obtained from celestial observations; interpolations were made to the times of the soundings when necessary. Such locations are considered accurate to one-half nautical mile, except during long intervals between fixes when overcast conditions prevailed. Accuracy in the latter case might drop to one or two miles.

Some depths tabulated were taken from meter-wheel readings. Although these values were generally similar to those derived from seismic travel times, many of those from T-3 (BRAVO) vary randomly from the seismic depths. The cause of the deviations is thought to have been a defective meter wheel.

3.1 Alpha Bathymetry

Scientists from the Lamont Geological Observatory conducted the seismic investigations during the entire period of occupation of Station Alpha (Hunkins, ¹¹ 1960). A twelve-channel seismic system was the prime instrument for the investigations. Twelve equally spaced, geophone-type seismometers were planted on the ice in a right-angle array with each leg 335 m long. The velocity of sound was derived from Matthews' tables (1939). Soundings were made twice daily in the summer and daily in the winter.

LATITUDE (NORTH)	LONGITUDE (WEST)	DEPTH (METERS)	DIP (DEGREES)	DIP AZIMUTH (DEGREES)
81 07	160 21	3320*		
82 12.2	164 34	3665	0.0	
82 31.3	164 58	3625	0.3	254
82 52.6	165 29	3647	17.4	233
83 00.2	165 46	3670	2.5	058
83 01.1	165 55	3641	1.2	079
83 00.4	166 14	3549	3.2	011
82 58.0	166 25	3527	4.3	047
82 54.3	166 33	3426	3.1	242
82 50.4	166 45	3514	2.2	253
82 48.0	166 51	3597	1.7	203
82 45.1	166 49	3666	3.2	231
82 44.1	166 44	3671	3.0	221
82 46.8	166 38	3656	3.2	260
82 48.7	166 49	3565	1.4	183
82 51.6	167 04	3537	0.4	100
82 53.9	167 16	3511	1.4	085
82 54.5	167 21	3488	0.7	219
82 53.8	167 36	3402	1.7	180
82 51.8	167 46	3329	2.3	269
82 52.9	167 22	3190	0.8	015
82 54.5	167 16	3159	1.8	241
82 56.1	167 10	3136	1.0	256
82 58.8	167 09	3113	0.1	292
83 01.5	167 14	3093	0.7	338
83 03.2	167 16	3112	2.0	333
83 05.2	167 15	3161	1.8	358
83 06.0	167 14	3188	0.9	355
83 09.7	167 21	3190	0.7	035
83 14.2	167 34	3183	0.3	007
83 14.5	167 20	3187	0.7	348
83 12.3	167 00	3177	0.8	308
83 14.6	166 34	3220	0.3	072
83 18.0	166 20	3268	1.2	038
83 23.5	166 13	3237	0.6	268
83 31.0	166 13	3185	0.8	115
83 33.7	166 21	3152	0.3	300
83 36.0	166 24	3133	0.5	190
83 37.9	166 26	3117	0.7	237
83 39.2	166 23	3106	0.5	044
83 44.8	166 33	3079	0.7	275
83 49.7	166 50	2971	3.6	120
83 53.0	167 17	1814	1.9	190
83 55.6	168 27	1604	2.5	191
83 53.3	168 50	1559	1.1	183
83 51.9	168 46	1568	1.2	226
83 50.4	168 24	1559	1.0	195
83 50.7	167 58	1514	0.2	167
83 52.9	167 41	1480	4.1	274
83 54.0	167 31	1450	1.6	003
83 56.4	167 08	1515	3.7	035
83 57.9	166 55	1563	4.4	295
83 59.9	166 37	1535	0.7	246
84 01.3	166 24	1482	0.9	223
84 03.0	166 10	1425	1.7	300
84 04.9	166 12	1520	2.2	299
84 06.2	166 17	1562	3.9	281
84 06.3	166 33	1808	5.5	149
84 06.2	166 48	1872	8.3	337
84 06.4	166 59	2358	2.6	341
84 06.5	167 04	2384	1.1	353
84 07.0	167 19	2447	0.4	030
84 07.8	167 33	2497	0.4	091

* Wire Sounding

LATITUDE (NORTH)	LONGITUDE (WEST)	DEPTH (METERS)	DIP (DEGREES)	DIP AZIMUTH (DEGREES)
84 08.5	167 48	2449	0.4	091
84 09.5	167 58	2434	0.7	124
84 10.2	168 11	2407	0.7	125
84 11.5	168 23	2392	0.7	125
84 13.1	168 33	2314	1.4	349
84 16.7	168 41	2238	2.1	140
84 20.4	168 50	2084	2.3	140
84 22.7	169 02	1972	0.4	010
84 24.0	169 09	1987	0.4	046
84 25.0	169 15	2000	0.5	095
84 27.0	169 26	1969	0.4	041
84 33.2	169 44	1921	0.6	009
84 37.2	169 25	1995	1.2	031
84 40.5	169 17	1960	0.9	108
84 42.3	169 29	1986	0.4	031
84 41.9	169 59	1949	1.2	115
84 39.7	170 03	1995	0.8	104
84 41.4	170 34	1997	0.8	112
84 40.6	171 17	2021	0.5	108
84 39.1	171 38	2049	0.5	093
84 37.4	171 29	1961	0.6	018
84 37.2	171 20	1927	1.2	337
84 36.8	171 09	1972	2.3	003
84 40.3	170 50	2024	1.7	002
84 41.9	170 57	2017	1.5	012
84 42.6	171 11	2029	1.3	358
84 42.1	171 27	2038	1.3	010
84 40.4	171 41	2024	1.4	345
84 39.1	171 03	2050	1.8	343
84 40.1	170 45	2028	0.2	224
84 43.0	170 18	2026	0.4	035
84 45.2	170 03	2000	0.6	214
84 47.8	169 50	1812	1.9	317
84 56.0	169 00	1588	0.7	351
84 59.3	168 39	1582	1.5	075
85 00.5	168 37	1565	1.5	032
85 01.8	168 46	1581	1.3	035
85 21.1	167 47	1934	2.8	025
85 22.2	167 32	1959	3.2	007
85 24.1	167 24	2020	9.5	335
85 28.0	167 56	2782	0.5	101
85 30.0	167 47	2499	5.5	191
85 29.5	167 54	2757	1.4	190
85 29.0	168 01	2749	2.0	137
85 28.4	168 09	2749	2.1	178
85 28.3	168 08	2742	1.6	165
85 28.1	168 08	2690	4.8	145
85 27.4	168 33	2670	13.0	166
85 26.2	169 15	2702	6.3	122
85 24.5	169 21	2715	2.0	000
85 23.3	169 10	2374	6.0	302
85 23.2	169 08	2380	8.1	302
85 23.0	169 00	2166	5.3	345
85 24.0	168 58	2153	1.6	030
85 24.9	169 08	2700	12.1	303
85 25.7	169 28	2705	0.6	090
85 26.1	169 42	2445	5.4	233
85 27.2	169 58	2228	2.0	027
85 27.7	170 06	2185	1.9	054
85 28.7	170 22	2156	3.1	055
85 30.0	170 42	2038	3.6	043
85 31.0	170 58	1937	3.4	349
85 31.6	171 02	1841	1.9	095

LATITUDE (NORTH)	LONGITUDE (WEST)	DEPTH (METERS)	DIP (DEGREES)	DIP AZIMUTH (DEGREES)
85 31.0	171 49	1745	5.2	004
85 31.0	171 50	1741	4.8	008
85 29.9	171 57	1715	5.8	004
85 28.7	172 07	1779	5.5	007
85 25.6	172 30	1562	3.7	053
85 22.9	172 41	1551	10.0	012
85 21.3	172 46	1509	6.2	346
85 16.9	172 37	2139	3.5	352
85 14.1	172 32	2018	0.9	224
85 10.4	172 26	1954	1.3	314
85 09.4	172 24	1820	4.2	314
85 07.6	172 21	1519	1.5	314
85 07.5	172 21	1448	1.0	313
85 05.7	172 18	1432	0.7	237
85 04.7	172 16	1436	0.6	213
85 03.4	172 14	1450	0.5	218
85 02.8	172 13	1475	0.3	245
85 02.1	172 14	1612	3.5	335
85 02.3	172 18	1732	4.2	197
85 01.5	172 45	1746	1.2	307
84 59.9	173 31	1755	13.4	306
85 00.9	173 05	1745	0.9	018
84 58.8	173 59	1662	3.4	247
84 59.3	175 20	1681	3.2	336
85 00.1	175 18	1710	5.3	335
84 59.9	175 46	1745	1.0	334
85 00.5	175 52	1747	2.0	051
85 00.9	176 12	1757	1.9	319
85 01.6	176 17	2520	1.6	318
85 02.3	176 09	2510	2.1	318
85 02.0	175 58	1709	5.6	016
84 54.8	176 09	1708	2.4	237
84 54.8	176 05	1686	2.5	327
84 49.0	176 20	1943	0.8	327
84 47.3	176 21	2034	0.6	327
84 38.0	176 11	2014	2.6	053
84 43.0	176 04	2177	2.9	324
84 30.2	174 53	1818	0.6	200
84 30.5	174 57	1827	1.2	203
84 32.5	174 03	2012	2.6	293
84 36.7	174 30	2057	1.2	294
84 42.8	175 12	2061	1.4	294
84 45.4	175 14	1874	7.3	294
84 55.8	175 19	1904	3.2	012
84 58.7	175 15	1903	4.0	305
85 04.2	174 40	1797	1.3	305
85 05.6	172 16	1531	1.2	220
85 05.9	173 39	1664	1.5	205
85 05.6	171 25	1497	2.6	312
85 04.8	171 44	1440	1.2	311
85 02.9	170 48	1427	0.8	345
85 02.9	171 00	1426	0.3	073
85 01.1	170 16	1535	2.9	212
85 00.7	170 06	1445	0.9	044
85 00.0	169 52	1434	1.4	017
84 59.3	169 38	1441	1.1	041
84 58.0	169 05	1560	1.2	311
84 50.1	168 39	1615	1.2	311
84 51.1	168 07	1887	1.2	311
84 48.7	168 01	1836	1.7	311
84 46.1	168 28	1892	1.1	230
84 45.3	168 42	1917	1.2	320
84 43.3	169 32	1968	1.7	320

LATITUDE (NORTH)	LONGITUDE (WEST)	DEPTH (METERS)	DIP (DEGREES)	DIP AZIMUTH (DEGREES)
84 42.4	169 31	1910	0.8	321
84 38.3	169 41	2015	1.6	168
84 36.8	170 04	2029	0.6	061
84 35.2	170 33	1953	0.8	331
84 34.0	170 56	1904	0.6	021
84 34.3	170 45	1918	1.5	037
84 34.3	170 52	1906	0.6	022
84 34.9	170 47	1910	1.0	058
84 35.6	170 39	1915	1.2	041
84 34.7	170 30	1913	1.0	058
84 34.0	170 16	1903	1.2	041
84 29.2	169 57	1905	0.8	069
84 27.2	169 50	1907	0.9	045
84 25.9	169 37	1929	1.3	315
84 25.0	169 31	1957	1.4	316
84 23.4	169 23	1959	0.4	049
84 20.9	169 10	2078	2.7	319
84 17.5	168 53	2320	1.4	073
84 16.0	168 45	2392	0.8	343
84 15.1	168 33	2411	0.8	344
84 14.1	168 18	2429	0.2	254
84 14.3	168 08	2408	0.2	247
84 14.9	167 47	2399	0.4	021
84 15.6	167 37	2411	0.7	053
84 17.3	167 24	2417	0.7	323
84 17.9	167 10	2397	0.7	323
84 19.3	166 36	2351	1.4	323
84 19.6	166 30	2343	0.7	177
84 20.3	166 11	2313	0.5	351
84 21.6	166 14	2299	0.8	352
84 24.8	166 09	2283	1.3	194
84 24.1	165 52	2258	2.2	311
84 24.6	166 02	2274	0.6	219
84 17.1	165 30	2330	0.5	311
84 22.2	165 45	2226	4.6	311
84 10.7	165 22	2271	1.0	007
84 14.7	165 27	2341	0.7	312
84 06.9	165 21	2041	5.0	015
84 01.0	165 21	1726	2.4	340
83 57.5	165 26	2045	12.5	340
83 55.1	165 25	2653	8.7	341
83 51.8	165 28	2929	2.8	076
83 50.2	165 30	2947	2.6	346
83 47.7	165 34	2997	1.9	346
83 47.7	165 40	3004	0.6	346
83 47.8	165 48	2993	4.4	346
83 46.5	165 52	3017	0.9	346
83 44.6	165 58	3040	0.4	184
83 42.6	166 12	3060	0.3	356
83 42.4	166 14	3069	0.3	042
83 41.5	166 13	3079	0.3	320
83 40.4	166 01	3082	0.4	185
83 40.1	165 37	3078	0.8	358
83 40.5	165 28	3075	0.4	359
83 41.4	165 09	3058	0.6	229
83 41.3	164 40	2930	2.6	233
83 41.4	165 00	3031	0.6	228
83 41.2	164 30	2862	1.3	054
83 41.0	164 12	2811	0.2	269
83 40.9	164 06	2810	1.1	208
83 40.7	163 58	2803	0.8	219
83 40.1	164 00	2818	1.4	332
83 38.6	164 03	2843	0.7	332

LATITUDE (NORTH)	LONGITUDE (WEST)	DEPTH (METERS)	DIP (DEGREES)	DIP AZIMUTH (DEGREES)
83 37.3	164 34	2809	2.9	054
83 38.7	164 48	2992	1.7	324
83 43.0	164 47	2921	0.7	324
83 46.0	164 39	2926	1.2	323
83 47.1	164 41	2947	0.5	323
83 47.3	164 43	2972	3.4	324
83 47.8	164 56	2993	0.6	325
83 49.1	165 03	2996	1.0	325
83 48.9	165 06	2999	0.1	212
83 47.8	165 06	3004	1.6	276
83 45.9	164 44	2918	1.7	014
83 39.6	163 48	2814	0.7	002
83 36.1	163 29	2835	0.6	002
83 34.3	163 19	2785	1.0	002
83 31.7	163 03	2673	1.9	003
83 31.8	162 53	2700	1.7	197
83 33.1	162 37	2470	1.8	209
83 33.5	162 23	2267	3.7	190
83 34.0	162 14	2479	5.6	042
83 35.0	161 59	2534	1.3	081
83 35.8	161 51	2458	2.4	002
83 37.7	161 45	2468	2.0	002
83 38.6	161 40	2474	1.8	003
83 38.6	161 35	2476	1.2	003
83 37.9	161 40	2479	0.5	033
83 37.7	161 38	2479	0.2	350
83 38.0	161 34	2478	0.8	350
83 37.0	161 46	2485	2.9	351
83 36.8	161 45	2585	2.9	222
83 37.5	161 39	2517	3.6	344
83 38.9	161 29	2502	1.9	045
83 39.7	161 23	2526	1.5	344
83 41.4	161 01	2549	0.3	344
83 44.1	160 40	2536	0.3	345
83 44.8	160 25	2541	0.7	259
83 42.1	160 25	2487	1.4	350
83 34.5	159 25	2730	3.4	094
83 27.2	158 55	2913	1.7	004
83 15.2	159 01	3079	1.1	075
83 15.8	159 13	2920	5.4	098
83 13.3	159 10	2979	1.4	075
83 12.9	158 52	3124	1.9	035
83 14.9	158 19	3247	1.1	001
83 21.0	157 12	3228	1.6	247
83 27.1	156 40	2973	2.0	338
83 29.8	156 48	2875	0.9	338
83 30.9	156 51	2861	3.2	210
83 30.4	157 00	2862	1.9	085
83 28.8	157 05	2906	3.1	355
83 27.0	157 36	3009	2.0	355
83 24.0	158 07	3096	0.4	356
83 22.7	158 30	3156	1.2	356
83 24.0	158 23	3156	1.8	356
83 24.7	158 20	3143	1.3	357
83 25.1	158 30	3096	1.4	357
83 26.1	158 12	3047	1.5	357
83 26.0	157 52	3067	2.1	091
83 25.7	157 24	3169	1.5	204
83 6.4	156 49	3044	1.4	068
83 26.5	156 31	3016	1.4	339
83 27.7	156 22	2981	1.6	339
83 29.5	156 25	2946	1.3	339
83 32.2	156 42	2849	0.7	079

LATITUDE (NORTH)	LONGITUDE (WEST)	DEPTH (METERS)	DIP (DEGREES)	DIP AZIMUTH (DEGREES)
83 39.5	157 22	2658	0.4	210
83 43.2	157 44	2203	6.5	021
83 42.8	157 40	2295	8.8	022
83 43.9	157 32	2143	5.3	022
83 45.6	157 29	2130	0.2	022
83 45.7	157 16	2051	0.7	023
83 44.8	156 54	2112	6.3	023
83 44.7	155 52	2307	0.8	117
83 45.7	155 27	2304	0.9	028
83 45.2	155 26	2271	1.6	028
83 44.3	155 20	2203	1.3	028
83 43.7	155 04	2198	1.2	029
83 44.5	155 03	2195	1.0	029
83 45.2	155 05	2199	0.8	029
83 45.5	155 02	2186	0.2	030
83 45.4	154 59	2186	0.2	030
83 46.3	155 07	2188	3.7	211
83 46.1	155 15	2186	0.2	030
83 45.6	155 10	2186	0.2	114
83 43.6	155 00	2184	1.0	024
83 42.5	154 42	2158	5.8	025
83 41.6	154 23	2261	1.5	025
83 41.1	154 14	2310	5.2	113
83 40.5	154 04	2528	3.4	024
83 37.1	154 10	2705	8.5	074
83 31.6	154 15	2843	4.2	117
83 29.9	154 16	2948	2.5	028
83 30.8	154 29	2920	4.4	028
83 33.4	154 25	2818	5.8	028
83 34.4	154 13	2833	4.9	072
83 36.2	154 07	2794	3.3	097
83 38.3	154 04	2831	2.0	007
83 40.7	154 15	2659	3.7	008
83 45.1	153 55	2613	1.8	108
83 44.6	153 58	2584	1.6	018
83 44.9	153 52	2554	4.0	099
83 45.3	154 06	2482	4.6	101
83 45.1	153 56	2589	3.2	121
83 43.1	153 53	2677	2.3	082
83 41.2	153 55	2657	1.5	104
83 38.5	153 57	2822	2.0	014
83 36.3	153 41	2953	1.4	015
83 35.3	153 37	2916	1.5	251
83 42.2	153 30	2780	5.3	242
83 45.3	153 37	2714	3.7	236
83 45.9	153 37	2677	3.6	240
83 51.8	153 37	2284	5.9	287
83 50.7	153 34	2311	4.8	291
83 48.7	153 46	2488	8.3	232
83 46.7	153 45	2596	5.4	242
83 46.5	153 17	2612	5.6	247
83 47.9	152 53	2603	1.8	010
83 48.0	152 38	2675	7.9	245
83 48.1	152 20	2737	8.0	238
83 48.6	152 20	2725	4.8	234
83 48.3	152 29	2686	3.4	024
83 48.0	152 37	2565	7.4	241
83 47.6	152 28	2683	4.2	017
83 47.6	152 22	2713	6.1	225
83 49.8	152 29	2668	6.5	221
83 49.0	152 28	2693	8.5	226
83 45.4	152 04	2859	3.6	252
83 45.7	151 50	2881	4.6	295

LATITUDE (NORTH)	LONGITUDE (WEST)	DEPTH (METERS)	DIP (DEGREES)	DIP AZIMUTH (DEGREES)
83 47.3	151 46	2864	3.2	266
83 49.1	151 52	2856	6.6	275
83 50.7	151 50	2774	5.6	280
83 52.4	151 56	2743	4.6	254
83 52.5	151 55	2740	3.3	267
83 52.4	151 55	2744	3.9	268
83 52.5	151 53	2742	4.1	267
83 53.0	151 55	2741	3.6	267
83 53.2	151 58	2741	4.5	260
83 54.7	152 02	2712	4.2	279
83 56.4	152 02	2656	5.3	270
83 57.5	152 00	2608	6.5	267
83 58.0	151 58	2605	5.4	267
83 57.8	151 55	2590	3.9	239
83 58.4	151 36	2611	4.7	252
83 59.0	151 33	2612	4.9	279
83 59.0	151 35	2534	4.2	241
84 00.0	152 31	2393	5.2	267
84 00.1	152 32	2436	7.2	268
83 57.6	152 35	2371	12.5	280
83 55.1	152 38	2302	4.2	268
83 51.9	152 45	2259	3.9	283
83 41.2	153 14	2774	4.7	257
83 40.7	153 05	2828	3.6	251
83 46.5	153 28	2652	5.8	251
83 46.1	153 40	2567	3.8	241
83 46.5	153 41	2625	4.4	249
83 44.0	153 20	2700	3.1	015
83 43.6	153 28	2776	5.6	257
83 43.5	152 50	2781	3.7	251
83 44.4	152 32	2850	4.7	260
83 49.4	151 56	2844	1.4	017
83 49.4	151 47	2839	2.1	123
83 50.0	151 31	2813	2.6	158
83 52.8	151 27	2780	2.6	138
83 55.7	151 34	2660	2.8	236
83 55.7	151 38	2646	1.5	215
83 55.1	151 36	2658	9.3	320
83 55.1	151 35	2657	4.9	313
83 55.3	151 21	2603	3.6	103
83 56.0	151 15	2322	21.3	129
83 56.4	151 31	2643	1.5	080
83 56.7	151 43	2638	0.8	284
83 56.7	151 54	2600	1.2	105
83 55.2	151 28	2482	18.5	049
83 54.2	151 12	2687	4.6	086
83 56.0	151 10	2657	3.0	186
83 55.8	151 41	2627	1.5	040
83 55.4	151 59	2588	5.4	107
83 59.0	151 26	2603	0.3	064
84 03.5	151 07	2575	3.8	045
84 08.5	150 43	2447	5.6	036
84 09.0	150 37	2472	6.4	199
84 09.2	150 22	2453	0.6	278
84 09.3	150 12	2429	1.3	217
84 09.7	149 46	1882	9.5	263
84 10.2	149 35	1827	16.4	178
84 11.3	149 28	2645	0.8	019
84 11.9	149 26	2556	13.4	271
84 13.8	149 20	1849	3.0	276
84 15.0	149 16	1713	7.5	261
84 16.2	149 12	1659	6.2	002
84 17.0	149 08	1777	6.8	023

LATITUDE (NORTH)	LONGITUDE (WEST)	DEPTH (METERS)	DIP (DEGREES)	DIP AZIMUTH (DEGREES)
84 18.4	149 01	1741	1.1	321
84 19.8	148 58	1759	2.8	231
84 22.0	148 53	1783	2.8	293
84 22.9	148 46	1640	2.1	25
84 23.1	148 38	1647	1.7	051
84 24.1	148 32	1642	0.6	141
84 27.5	148 30	1688	0.0	-
84 29.0	148 09	1706	2.5	231
84 30.8	147 59	1732	5.0	321
84 32.0	147 53	1781	1.5	300
84 33.1	147 44	1750	0.8	278
84 34.0	147 50	1773	5.0	116
84 33.0	147 58	1793	7.9	061
84 32.7	147 41	1800	9.4	223
84 35.0	147 36	1771	7.4	306
84 36.8	147 35	1900	4.0	225
84 38.0	147 34	1889	2.7	348
84 38.4	147 33	1848	6.5	161
84 38.9	147 37	1925	17.5	113
84 36.5	147 38	1876	5.6	139
84 37.2	147 34	1853	7.9	066
84 36.1	147 38	1886	1.4	003
84 34.6	147 49	1871	19.6	048
84 35.1	147 42	1894	4.5	084
84 36.7	147 43	1934	3.7	300
84 37.1	147 43	1932	8.3	255
84 37.5	147 45	1983	7.5	339
84 40.1	147 55	1770	5.1	296
84 40.8	147 53	1822	5.6	299
84 41.5	147 48	1758	8.1	154
84 41.4	147 37	1902	8.5	314
84 41.3	147 31	1837	4.8	146
84 41.1	147 24	1857	2.3	313
84 41.2	147 18	1809	6.2	147
84 41.1	147 10	1889	1.5	168
84 40.9	147 11	1830	13.7	304
84 39.5	147 16	1864	2.0	147
84 37.8	146 58	2011	9.3	126
84 36.7	146 49	2132	1.7	058
84 34.8	146 39	1919	3.2	110
84 33.7	146 28	2201	9.3	130
84 32.7	146 16	2310	2.6	205
84 32.0	146 10	2343	0.3	330
84 31.7	146 05	2306	1.4	188
84 31.9	145 48	2313	1.5	173
84 31.8	145 11	2301	0.8	287
84 31.0	144 54	2294	2.7	217
84 31.0	144 34	2144	4.4	108
84 31.2	144 06	2167	2.8	148
84 32.2	143 32	2118	0.8	288
84 32.1	143 15	2122	2.1	356
84 31.9	142 54	2147	1.1	062
84 31.8	142 35	2121	6.0	221
84 32.1	142 33	2144	7.2	100
84 32.4	142 31	2156	3.1	322
84 33.2	142 26	2158	2.5	242
84 33.0	142 50	2135	2.6	201
84 31.9	143 15	2156	1.6	293
84 32.1	143 42	2163	2.8	294
84 32.7	143 58	2170	3.6	150
84 33.0	143 26	2116	2.1	127

LATITUDE (NORTH)	LONGITUDE (WEST)	DEPTH (METERS)	DIP (DEGREES)	DIP AZIMUTH (DEGREES)
84 32.8	143 23	2181	2.0	248
84 32.6	143 44	2170	2.9	044
84 32.8	143 34	2174	0.6	036
84 33.0	143 24	2159	-	-
84 33.6	143 23	2130	5.0	293
84 34.0	143 22	2131	6.7	299
84 35.3	143 20	2219	1.4	330
84 36.0	143 12	2216	5.2	042
84 37.2	142 29	2152	1.2	330
84 38.2	141 53	2179	2.6	062
84 39.2	141 19	2158	3.7	257
84 40.3	140 43	2132	3.7	258
84 42.2	140 19	2056	6.9	274
84 44.2	140 10	1918	3.3	275
84 46.2	140 05	2038	6.9	300
84 47.2	140 04	2085	6.0	291
84 48.3	140 04	2079	4.1	342
84 48.8	140 03	2128	2.8	310
84 49.3	139 57	2119	2.3	341
84 49.8	139 52	2072	5.4	293
84 50.4	139 45	2048	8.7	261
84 51.1	139 39	2016	4.5	342
84 51.8	139 33	1988	0.8	303
84 52.4	139 27	1899	6.7	305
84 53.7	139 15	1884	5.9	269
84 54.3	139 08	1829	2.5	263
84 55.7	138 56	1688	5.1	253
84 57.6	138 37	1714	4.2	301
84 59.6	138 19	1800	2.8	309
85 00.9	138 01	1817	4.4	309
85 01.4	137 52	1776	2.0	010
85 01.2	137 42	1813	1.6	324
85 01.3	137 44	1833	9.6	272
85 01.7	137 53	1802	5.9	026
85 02.2	138 05	1875	5.8	106
85 03.5	138 36	2042	2.8	182
85 03.6	138 50	2075	2.2	138
85 02.8	138 54	2073	2.0	103
85 02.4	138 56	2079	1.4	087
85 02.0	138 59	2082	1.9	240
85 01.9	138 46	2063	2.0	132
85 01.9	138 24	1958	1.5	109
85 02.0	138 04	1843	2.4	122
85 01.9	137 32	1836	2.0	102
85 00.2	137 04	1865	4.0	222
85 00.0	136 52	1950	3.1	114
84 59.3	136 33	1982	1.3	242
84 58.4	136 13	1966	1.7	168
84 58.1	135 59	1951	4.8	068
84 59.0	136 00	1978	4.5	182
84 59.7	136 02	1968	3.4	090
85 00.4	136 06	1964	2.4	123
85 01.2	136 14	1969	1.4	087
85 03.1	136 32	1943	2.3	342
85 06.3	136 38	1922	2.0	282
85 06.4	136 11	1896	1.6	131
85 07.1	136 14	1862	5.4	095
85 06.0	135 32	1881	5.3	125
85 02.9	135 04	1878	0.6	019
85 02.7	134 47	1898	2.2	354
85 01.3	133 58	1846	3.4	258
84 59.3	133 37	1827	-	-
84 59.1	133 16	1794	6.2	228

LATITUDE (NORTH)	LONGITUDE (WEST)	DEPTH (METERS)	DIP (DEGREES)	DIP AZIMUTH (DEGREES)
85 00.2	132 45	1761	6.5	265
85 02.1	131 55	1724	1.3	203
85 03.6	131 13	1703	6.8	262
85 05.0	130 35	1717	4.8	118
85 05.5	130 16	1738	6.1	344
85 06.6	129 59	1806	0.6	243
85 08.7	129 50	1776	2.8	136
85 10.6	129 42	1715	2.7	214
85 15.0	129 15	1769	1.6	033
85 20.2	128 48	1878	3.6	318
85 23.4	128 32	1961	0.8	094
85 27.7	128 11	1761	6.5	187
85 33.4	127 47	1589	2.8	101
85 38.8	127 26	1388	2.1	119
85 45.0	126 18	1478	2.3	217
85 48.2	125 29	1428	1.0	311
85 51.4	124 39	2200	3.1	126
85 54.2	123 51	2111	13.0	094
85 44.9	120 14	1518	0.6	175
85 44.4	120 17	1419	-	-
85 41.8	120 36	1124	1.6	206
85 40.8	120 42	1066	4.2	205
85 39.5	120 31	1030	8.0	012
85 40.5	119 58	1047	2.3	024
85 43.4	119 38	1720	8.2	033
85 49.5	119 25	2228	9.1	075
85 52.5	120 11	2672	2.7	028
85 55.7	119 47	2574	3.7	185
85 57.3	119 31	2471	1.1	266
85 59.1	119 21	2380	6.6	008
86 00.6	119 20	2369	2.0	356
86 02.0	119 25	2404	2.5	169
86 03.3	119 50	2450	22.0	205
86 04.3	120 06	2348	2.3	185
86 06.0	120 35	1875	19.5	184
86 07.8	121 04	1539	-	-
86 08.6	121 18	1401	6.9	209
86 18.5	121 44	1494	-	-
86 25.3	120 50	1580	-	-
86 25.2	118 06	1644	-	-
86 13.1	114 57	1220	-	-
86 11.8	114 32	1162	-	-
86 09.9	113 56	1152	-	-
86 10.3	113 44	1140	-	-

3.2 T-3 (Bravo) Bathymetry

Bathymetric data from this station were obtained by representatives from AFCRL, WHOI, ANA, USGS, and LGO (see Table 1). Several different commercial exploration seismic systems and array configurations were in use at various periods. Small differential motions in various portions of the ice pack made it necessary to change the size and orientation of these spreads at various times. Ocean bottom attitudes were not obtained at times when the lack of geophone cables prevented the establishment of arrays sufficiently large to make such calculations with confidence or when only one or two recording channels were available.

For periods that dip and dip azimuths are presented, the array configurations and dimensions were:

1958 (May-Sept) - T array Maximum dimensions
950 m x 525 m (triangular area ranged
from 6,500 m to 180,000 m)

1959 (Oct-Dec) - L shaped array, 570 m x 415 m

For the period 28 September to 19 December 1959, the soundings tabulated have been corrected for dip and represent the ocean depth vertically below the shot point; however such a correction is valid only in cases where the reflector is a plane surface. Any of these depths can be converted to the type used elsewhere in this report (i.e., the normal to the nearest reflector. See p.45) by multiplying the tabulated value by the cosine of the dip angle. Depths listed for the period 2 to 26 March 1960 were calculated from records obtained with a single hydrophone and an explosive source. The initial and reflected pulses were recorded on one of two channels of an electric stylus recorder; one-second signals from a break-circuit chronometer were registered on the other. Three records were made in rapid succession, and the times were averaged. The chart speed and time base in this system did not possess the level of precision available in a seismic system; therefore depths are probably accurate to approximately 10 m.

Velocities of sound through water were calculated using the available oceanographic data and Kuwahara's¹⁶ empirical tables (1939) for the periods May to September 1958 and May to September 1959 and from Matthews'¹⁷ tables (1939) for April and May 1960 (Hunkins,¹¹ 1960). The remainder were derived from formulas given by Crary and Goldstein⁴ (1957):

$$\begin{aligned}\bar{V} \text{ (m/sec)} &= 1442 + 6.8T & T > 3.5 \text{ sec} \\ \bar{V} &= 1443 + 6.7T & 3.5 > T > 1.7 \text{ sec} \\ \bar{V} &= 1437 + 11.0T & T < 1.7 \text{ sec}\end{aligned}$$

where \bar{V} represents the average velocity and T , the total two-way travel time.

The shallow depths encountered during the periods 19 April to 30 May and July to September 1960 were determined with a weighted hand line marked at appropriate intervals. Selected wire soundings for other intervals during which

seismic ocean depths were not obtained are also presented in this report; however, the accuracy of the deeper (> 500 m) ones is somewhat questionable.

DATE (1957)	TIME (GMT)	LATITUDE (NORTH)	LONGITUDE (WEST)	DEPTH (METERS)
20 MAY	--	82 51	96 00	1360*
22 JUN	--	82 31	99 45	1055
29	--	82 24	100 10	815
1 JUL	--	82 21	100 40	1055
3	--	82 20	101 00	850
4	--	82 16	101 00	605
15	--	82 02	102 15	695
17	--	82 02	102 10	695
18	--	82 02	102 05	690
23	1900	82 04	101 45	675
26	1500	82 07	101 35	645
28	2200	82 08	101 20	595
31	2300	82 10	101 10	590
3 AUG	2100	82 11	101 00	585
8	2300	82 11	101 15	570
9	2100	82 10	101 20	590
10	2100	82 10	101 25	600
15	2200	82 11	101 10	570
20	1900	82 13	101 10	560
25	0200	82 13	101 20	510
27	2000	82 16	99 15	620
30	2000	82 20	98 30	595
1 SEP	1900	82 24	97 55	545
3	2100	82 24	97 55	535
9	0300	82 21	98 10	570
11	2300	82 19	99 05	620
17	2200	82 05	103 20	1630
18	2000	82 05	104 05	2005
20	2000	82 03	103 55	1770
22	1900	81 59	104 15	1935
25 OCT	2100	81 15	107 50	1340*
28	2100	81 08	107 55	965*
30	2100	81 07	107 50	1045
1 NOV	2100	81 08	108 00	1072*
2	2100	81 07	108 15	1160
4	2100	81 01	109 00	1115
7	2100	80 56	109 20	930
8	2100	80 53	109 30	935
11	2100	80 50	109 45	930
17	2100	80 51	109 50	925*
18	2100	80 47	109 55	925
24	2100	80 44	110 25	965
6 DEC	1600	80 18	114 30	920
7	1630	80 16	114 35	897
10	1530	80 17	114 20	889
14	1530	80 18	113 40	908
17	1930	80 19	113 30	895

1958

9 NOV	1700	77 59	122 35	380
11	2000	77 57	122 50	480
14	1800	77 51	122 45	365
17	2000	77 43	122 50	385
18	1730	77 40	122 50	395
18	1930	77 39	122 50	370
19	1700	77 36	122 55	355
19	1930	77 36	123 00	365
20	1835	77 33	123 00	350
20	2000	77 33	123 00	345
21	2230	77 31	123 05	360
24	2120	77 23	123 10	315

*Wire sounding

DATE (1958)	TIME (GMT)	LATITUDE (NORTH)	LONGITUDE (WEST)	DEPTH (METERS)
25 NOV	2200	77 19	123 25	325
26	2215	77 13	123 30	255
26	2300	77 13	123 30	245
28	1945	77 05	123 30	260
28	2105	77 04	123 30	300
1 DEC	1930	76 45	124 05	285
1	1950	76 45	124 05	275
2	1730	76 39	124 10	260
2	1900	76 38	124 10	250
3	2000	76 32	124 20	230
3	2110	76 32	124 20	230
4	1840	76 28	124 25	215
4	1910	76 27	124 25	220
6	1815	76 26	124 15	200
6	1840	76 26	124 15	200
9	1825	76 07	125 25	305
10	1835	76 02	125 15	335
11	1850	75 56	125 20	355
12	2230	75 49	125 30	385
12	2340	75 48	125 30	385
14	0600	75 39	125 45	385
14	1800	75 38	125 40	385
15	0200	75 34	125 45	390
16	2315	75 26	126 00	395
17	2310	75 24	126 15	390
19	2340	75 20	126 10	390
20	2355	75 16	126 15	385
22	1845	75 12	126 25	395
22	1930	75 12	126 25	385
23	2145	75 15	126 40	385
24	1905	75 19	126 45	380
27	0355	75 22	126 45	385
27	2305	75 22	126 45	380
29	0315	75 21	126 30	385
29	2325	75 22	126 30	385
1959				
4 JAN	2000	75 11	126 35	395
4	2100	75 11	126 35	400
6	0005	75 10	126 55	400
6	2235	75 08	127 20	385
6	2320	75 08	127 25	385
11	0745	74 57	128 01	380
13	2335	74 49	128 06	395
14	0015	74 48	128 06	390
19	2355	74 45	128 03	380
21	2000	74 36	128 09	385
23	0015	74 34	128 12	370
24	0040	74 32	128 14	370
27	2305	74 27	128 01	380
31	2240	74 23	128 10	380
2 FEB	2235	74 17	128 12	375
5	2305	74 10	128 17	375
7	2320	74 08	128 18	370
10	2155	74 07	128 21	370
10	2235	74 07	128 22	370
12	2130	74 06	128 24	370
16	2140	74 07	128 22	380
18	2255	74 10	128 24	375
18	2340	74 11	128 24	370
20	2055	74 12	128 28	375
23	2045	74 06	128 16	350

DATE (1959)	TIME (GMT)	LATITUDE (NORTH)	LONGITUDE (WEST)	DEPTH (METERS)
25 FEB	2045	74 05	128 14	370
27	2210	74 04	128 14	360
28	2130	74 05	128 15	355
3 MAR	0015	74 04	128 20	355
4	2350	74 04	128 22	360
6		74 04	128 20	355
7	1840	74 04	128 20	360
11	2300	74 05	128 18	370
11	2345	74 05	128 18	355
12	2115	74 05	128 17	360
12	2350	74 04	128 17	355
14	2145	74 04	128 18	360
16	2210	74 04	128 22	360
19	1920	74 04	128 16	365
19	2005	74 04	128 16	360
23	2310	74 04	128 18	360
25	2200	74 04	128 14	365
28	2220	74 04	128 17	350
31	1850	74 05	128 16	365
2 APR	2230	74 04	128 20	355
4	2350	74 04	128 44	385
6	2255	74 04	128 46	380
8	2215	74 04	128 47	385
10	2140	73 59	128 52	430
15	0045	73 56	129 01	390
15	0200	73 56	129 01	395
15	2325	73 55	129 01	395
16	0000	73 55	129 02	395
16	0030	73 55	129 02	400
16	2000	73 54	129 05	425
17	1910	73 53	129 08	425
18	1800	73 52	129 12	445
20	2230	73 45	129 14	605
20	2330	73 44	129 15	620
21	1800	73 44	129 16	615
22	0000	73 44	129 18	615
22	1910	73 44	129 24	620
23	2230	73 44	129 15	620
24	2200	73 46	129 22	635
26	0030	73 42	129 28	660
28	0000	73 43	129 22	755
28	1830	73 44	129 22	700
29	1900	73 44	129 22	645
30	1815	73 45	129 22	640
1 MAY	1915	73 46	129 21	645
2	1900	73 44	129 21	655
3	1900	73 43	129 21	660
4	1900	73 41	129 21	740
5	1800	73 39	129 21	995
6	1855	73 39	129 24	1000
7	1840	73 37	129 26	705
8	1835	73 36	129 27	735
9	0015	73 35	129 28	745
9	1515	73 34	129 29	845
10	2120	73 33	129 33	950
11	1810	73 33	129 36	810
12	1740	73 33	129 39	790
13	2230	73 34	129 47	770
14	2230	73 35	129 53	865
16	0005	73 34	129 57	1390
16	1935	73 34	129 59	1525
18	0030	73 34	130 02	1670
18	1920	73 34	130 05	1620

DATE (1959)	TIME (GMT)	LATITUDE (NORTH)	LONGITUDE (WEST)	DEPTH (METERS)
20 MAY	0305	73 30	130 07	1870
20	1835	73 28	130 08	1800
21	2245	73 23	130 11	1535
23	0645	73 19	130 14	1860
24	0050	73 16	130 16	1950
24	2335	73 13	130 18	1980
25	2250	73 07	130 32	2075
26	1935	73 03	130 28	1930
27	1930	73 00	130 25	1880
29	0215	72 55	130 20	1715
29	2245	72 51	130 19	1595
30	2315	72 45	130 17	1465
1 JUN	0655	72 40	130 15	1260
2	0515	72 38	130 13	1150
3	0020	72 36	130 12	1105
3	2325	72 34	130 09	1065
4	2245	72 31	130 06	1065
6	0800	72 27	130 12	1160
7	0700	72 26	130 28	1185
8	0415	72 25	130 41	1160
9	0540	72 22	130 36	1080
10	0600	72 18	130 32	975
11	0545	72 16	130 27	810
12	0650	72 13	130 21	590
13	0045	72 11	130 19	565
13	2130	72 09	130 16	535
15	0515	72 07	130 20	540
16	0635	72 05	130 27	595
17	0045	72 04	130 42	685
18	0755	72 03	130 56	870
23	0020	71 50	131 27	940
23	2000	71 48	131 34	980
25	0300	71 49	131 48	1065
26	0640	71 50	131 58	1185
26	2350	71 53	132 04	1265
28	0020	71 55	132 12	1260
29	1830	71 57	132 24	1410
30	2345	71 58	132 31	1445
2 JUL	0535	71 58	132 32	1485
2	2350	71 58	132 32	1500
3	2355	71 56	132 29	1475
4	1935	71 54	132 26	1460
6	0035	71 52	132 23	1420
7	0545	71 54	132 26	1410
7	2045	71 55	132 27	1420
9	0200	71 57	132 31	1470
10	0755	71 56	132 29	1430
11	0055	71 55	132 29	1435
12	0740	71 49	132 31	1425
13	0800	71 45	132 32	1425
14	0735	71 41	132 33	1340
15	0940	71 36	132 37	1040
16	0920	71 36	132 41	880
17	0020	71 37	132 45	855
18	0200	71 38	132 54	1140
19	0800	71 40	133 11	1190
20	0745	71 41	133 16	1145
20	2310	71 41	133 20	1130
22	0235	71 37	133 13	1200
26	0850	71 29	133 30	1105
27	0715	71 27	133 33	950
28	0925	71 26	133 26	815
29	2330	71 28	133 16	845

DATE (1959)	TIME (GMT)	LATITUDE (NORTH)	LONGITUDE (WEST)	DEPTH (METERS)
30 JUL	0950	71 30	133 14	1020
31	0840	71 30	133 12	1040
1 AUG	0855	71 29	133 20	1145
2	0835	71 27	133 27	1010
3	0845	71 25	133 39	1020
4	0955	71 24	133 55	970
5	0810	71 24	134 08	1020
6	0455	71 23	134 22	1005
7	0835	71 19	134 34	800
8	0800	71 15	134 33	790
9	0840	71 12	134 22	820
10	0835	71 10	134 17	580
11	0835	71 09	134 16	520
12	0815	71 07	134 09	525
13	0835	71 06	134 05	535
14	0855	71 09	134 16	555
15	0900	71 11	134 24	650
16	0930	71 13	134 33	680
17	0955	71 16	134 41	775
18	0830	71 19	134 49	1120
19	0715	71 24	134 57	1400
20	0735	71 26	135 03	1560
21	0655	71 27	135 08	1590
22	0750	71 27	135 12	1495
23	0745	71 25	135 15	1395
23	2250	71 25	135 16	1340
25	0730	71 24	135 30	1335
26	0820	71 23	135 30	1325
27	0140	71 22	135 25	1300
28	0125	71 20	135 18	1290
29	0110	71 22	135 28	1345
30	0105	71 23	135 38	1365
31	0225	71 25	135 45	1335
1 SEP	0200	71 26	135 52	1185
3	0215	71 29	136 06	1370
4	0225	71 30	136 14	1535
5	0300	71 31	136 25	1610
6	0240	71 32	136 44	1930
6	1850	71 33	136 55	2075
8	0210	71 37	137 13	2135
9	0130	71 39	137 00	2120
10	0230	71 41	136 47	2055
11	0235	71 40	136 41	2005
12	0245	71 38	136 34	1965
13	0245	71 36	136 25	1920
14	0220	71 37	136 21	1930
15	0320	71 37	136 20	1925
16	0320	71 37	136 21	1930
17	0215	71 37	136 20	1925
18	0210	71 37	136 12	1915
19	0035	71 39	136 09	1910
19	0310	71 39	136 11	1910
20	0050	71 38	136 20	1885
21	0215	71 38	136 30	1875
22	0145	71 34	136 40	1840
23	0200	71 30	136 50	1705
24	0230	71 27	137 00	1730
25	0645	71 22	137 12	1550
26	0255	71 19	137 20	1540
26	1915	71 17	137 34	1570
22 DEC	--	71 06	145 09	1425
24	0220	71 05	145 06	1645
29	0210	71 04	145 00	1364
30	0025	71 03	144 59	1376

DATE (1960)	TIME (GMT)	LATITUDE (NORTH)	LONGITUDE (WEST)	DEPTH (METERS)
1 JAN	0220	71 03	144 57	1652
3	0225	71 02	144 58	1574
6	0240	71 02	145 05	718
8	0130	71 01	145 10	952
13	0235	71 00	145 17	796
14	0035	71 01	145 16	796
16	0215	71 00	145 13	799
20	0140	70 58	145 00	524
24	0245	70 52	145 46	524
26	0730	70 53	145 51	524
2 MAR	0145	72 08	152 07	2990
3	0230	72 03	151 44	2650
3	2255	71 59	151 21	2790
6	0140	71 49	150 35	2660
7	0055	71 48	150 32	2530
7	2045	71 47	150 30	2500
9	0135	71 47	150 30	2480
10	0155	71 46	150 30	2500
11	0130	71 46	150 29	2450
12	0030	71 45	150 29	2410
13	0100	71 45	150 29	2430
14	0115	71 46	150 30	2490
15	0020	71 46	150 30	2390
16	0030	71 46	150 31	2390
16	2345	71 46	150 31	2390
18	0015	71 48	150 34	2390
19	0215	71 49	150 37	2390
20	0105	71 51	150 41	2390
21	0110	71 52	150 44	2660
22	0145	71 53	150 47	2670
23	0215	71 55	150 50	2690
26	0100	72 08	153 02	1988
27	0050	72 11	153 33	2107
28	0150	72 14	153 56	2027
30	2118	72 11	154 00	1992
4 APR	--	72 11	154 00	1800
7	0120	72 09	154 47	1362
7	1820	72 10	155 08	794
8	0145	72 10	155 20	514
8	1900	72 10	155 40	307
8	2040	72 10	155 41	316
8	2325	72 10	155 47	278
9	2020	72 09	156 03	210
10	0327	72 08	156 17	191
10	1955	72 06	156 28	163
11	0217	72 06	156 29	149
12	1802	71 59	156 51	93
13	0608	71 56	156 57	76
15	1910	71 49	157 15	64
19	0015	71 44	157 13	63*
20	0150	71 44	157 18	62*
21	0400	71 43	157 24	62*
21	2000	71 43	157 25	62*
22	2100	71 43	157 25	63*
23	2300	71 42	157 26	62*
24	2030	71 40	157 27	57*
25	2300	71 38	157 29	63*
26	2100	71 38	157 23	66*
27	2200	71 41	157 24	62*
28	2000	71 42	157 40	62*
29	0300	71 43	157 46	62*
29	2300	71 44	157 56	62*

* Wire sounding

DATE (1960)	TIME (GMT)	LATITUDE (NORTH)	LONGITUDE (WEST)	DEPTH (METERS)
30 APR	2300	71 46	158 15	56*
2 MAY	0323	71 48	158 41	55*
2	1930	71 50	158 56	52*
3	2030	71 54	159 10	49*
4	1900	71 55	159 24	46*
4	2250	71 55	159 25	45*
5	2400	71 54	159 31	47*
6	1900	71 53	159 35	49*
7	0200	71 53	159 35	49*
7	2000	71 52	159 38	49*
9	0215	71 52	159 37	51*
9	2100	71 52	159 35	50*
10	2000	71 50	159 30	50*
11	2000	71 50	159 30	51*
14	--	71 51	159 45	50*
16	1830	71 51	159 40	52*
18	0200	71 51	159 42	50*
18	2100	71 51	159 48	48*
20	2330	71 51	160 0	48*
21	1900	71 51	160 05	44*
23	0730	71 51	160 14	40*
23	1845	71 50	160 19	42*
24	2300	71 50	160 22	42*
26	0800	71 50	160 22	42*
28	1900	71 50	160 22	42*
30	1900	71 50	160 22	42*

* Wire sounding

DATE (1958)	TIME (GMT)	LATITUDE (NORTH)	LONGITUDE (WEST)	EST. ERROR (MILES)	DEPTH (METERS)	DIP (DEGREES)	DIP AZIMUTH (DEGREES)
7 MAY	1900	80 17	114 10	2	1200	1.8	10
8	1955	80 16	114 25	2	1245	2.5	10
8	2150	80 16	114 35	2	1250	3.0	10
9	1645	80 15	114 45	1	1305	1.4	0
9	1935			1	1320		
9	2040			1	1315		
9	2140			1	1315	2.2	10
10	1520	80 12	115 10	2	1370	1.4	290
10	1540			2	1350		
12	1640	80 04	116 00	4	1335	1.4	330
12	2100			4	1320	1.7	340
13	2100	79 58	116 10	5	1275	1.6	310
14	2150	79 59	116 00	5	1270	2.2	350
15	1450	79 59	116 00	3	1285	1.9	290
16	1420	80 04	116 00	3	1360	1.8	0
16	2000			3	1370	1.6	330
17	1610	80 05	115 50	4	1365	1.7	350
18	1715	80 04	115 50	3	1325	2.1	10
19	1850	80 01	115 50	1	1280	1.0	290
20	1520	80 00	115 40	1	1225	1.8	350
21	1605	79 59	115 40	2	1200	2.6	0
24	1500	80 00	115 40	3	1195	1.6	330
25	1555	79 59	115 40	2	1205	2.4	340
26	1455	79 58	115 40	1	1190	2.0	330
27	2015	79 55	115 40	2	1155	1.7	320
28	2025	79 53	115 40	3	1130	1.3	320
29	2020	79 51	115 30	4	1095	2.0	330
30	1540	79 52	115 30	3	1080	2.2	330
31	1430	79 52	115 30	2	1085	2.1	330
1 JUN	1540	79 52	115 30	2	1095	2.9	350
2	1520	79 53	115 30	2	1090	1.8	320
3	1415	79 53	115 10	3	1085	1.7	300
4	1820	79 52	115 05	3	1085	2.8	350
5	2020	79 49	115 25	3	1110	2.6	330
6	1415	79 49	115 40	3	1135	2.4	350
7	1435	79 51	116 15	5	1200	1.6	350
8	1640	79 52	116 30	5	1240	1.5	320
10	1355	79 48	116 40	2	1255	1.2	320
11	1430	79 47	116 40	2	1205	3.2	340
12	1405	79 46	116 35	2	1180	2.1	340
13	1400	79 45	116 25	2	1180	1.6	310
14	1620	79 46	116 20	4	1180	1.6	310
15	1745	79 47	116 20	7	1170	1.9	310
16	1525	79 48	116 20	7	1170	1.9	330
18	1455	79 48	116 10	2	1150	1.6	320
19	1410	79 48	116 10	2	1150	1.8	320
20	1440	79 47	116 10	2	1150	1.1	300
21	1425	79 46	116 10	2	1150	1.1	300
22	1840	79 46	116 10	2	1150	1.2	300
23	1420	79 45	116 10	2	1150	1.2	310
25	1815	79 44	116 15	1	1155	1.5	330
25	1830			1	1155	1.5	4
27	1510	79 43	116 20	2	1165	1.1	320
28	1535	79 42	116 20	2	1145	1.1	320
30	1830	79 41	116 20	2	1155	1.3	310
2 JUL	1505	79 37	116 50	5	1265	1.0	340
2	2100		116 55	5	1280	1.8	10
3	1615	79 36	117 00	7	1290	1.1	300
5	1530	79 36	117 30	5	1495	1.0	300
6	1650	79 36	117 50	4	1620	0.7	300
7	1445	79 30	118 10	5	1700	0.9	310
7	1455			5	1710	0.8	300
7	2115	79 29	118 10	5	1750	0.6	280

DATE (1958)	TIME (GMT)	LATITUDE (NORTH)	LONGITUDE (WEST)	EST. ERROR (MILES)	DEPTH (METERS)	DIP (DEGREES)	DIP AZIMUTH (DEGREES)
8 JUL	1445	79 26	118 20	6	1825	0.5	290
8	2040	79 25	118 20	7	1845	0.5	260
9	1450	79 22	118 40	5	1915	0.5	300
9	2125	79 21	118 40	5	1930	0.7	300
10	1455	79 20	118 40	3	1915	0.5	270
10	2100	79 19	118 40	3	1920	0.7	320
11	1430	79 17	118 50	3	1910	0.7	340
12	1425	79 16	118 50	2	1905	0.6	310
13	1545	79 15	118 50	1	1890	0.6	310
14	1515	79 13	118 40	2	1890	0.6	330
15	1350	79 12	118 30	3	1870	.3	280
16	1520	79 11	118 15	3	1840	.9	300
17	1355	79 13	118 20	3	1850	0.7	340
18	1435	79 14	118 30	2	1885	0.9	280
19	1410	79 14	118 30	2	1900	0.7	330
21	1540	79 15	118 40	2	1885	0.7	350
22	1355	79 15	118 40	2	1870	0.6	310
23	1830	79 15	118 45	2	1870	0.7	310
23	19 5			2	1870	1.0	320
24	1350	79 15	118 50	1	1870	0.8	290
25	1450	79 14	118 55	2	1905	0.6	250
25	1920			2	1925	0.9	340
26	14 5	79 11	119 00	2	1965	1.2	260
27	1410	79 08	119 10	2	1985	0.8	310
28	1525	79 07	119 10	1	2035	0.9	260
29	1355	79 05	119 25	2	2045	1.7	330
30	1520	79 04	119 40	1	2065	1.1	340
31	1520	79 04	119 50	2	2010	1.3	310
1 AUG	1450	79 03	120 10	4	2050	1.6	300
2	1350	79 02	120 30	4	2095	1.2	330
2	1415			4	2095	1.5	330
3	1600	79 01	120 45	4	2160	1.5	340
4	1435	79 00	121 15	3	2200	0.8	300
5	1420	79 01	121 15	3	2205	0.7	0
6	1605	79 02	121 10	3	2195	0.8	10
7	1410	78 59	121 10	3	2175	0.6	20
8	1555	78 54	121 20	2	2135	2.1	340
9	1620	78 52	121 10	3	2115	1.6	330
10	1610	78 52	121 20	2	2120	0.9	320
11	1600	78 51	121 40	3	2155	0.5	290
12	1400	78 50	122 00	2	2175	1.2	270
13	1610	78 50	122 00	2	2185	1.3	20
14	1930	78 50	122 00	2	2190	1.0	350
15	1440	78 52	122 00	1	2210	1.0	310
16	1500	78 54	122 10	3	2255	1.4	340
17	1555	78 51	122 30	4	2265	1.0	330
18	1545	78 49	122 45	4	2230	1.7	340
19	1930	78 47	122 45	2	2180	1.2	320
20	1555	78 45	122 45	1	2155	1.7	340
21	1355	78 44	122 40	1	2130	1.4	0
22	2125	78 42	123 10	3	2095	1.8	0
24	1720	78 42	123 20	4	2090	1.7	320
25	1545	78 44	123 30	4	2145	1.7	300
26	1400	78 49	123 40	5	2310	1.5	320
27	1450	78 53	123 40	7	2405	0.9	340
28	1425	78 55	123 40	8	2465	0.8	330
29	1505	78 57	124 00	10	2520	0.9	300
30	1455	78 54	124 10	9	2475	1.3	330
31	1610	78 52	124 10	8	2450	1.8	330
1 SEP	1510	78 49	124 15	7	2380	1.3	320
2	1445	78 47	124 30	6	2375	1.2	340
3	1500	78 44	124 20	4	2330	1.4	310
4	1800	78 40	124 10	3	2210	1.7	310

DATE (1958)	TIME (GMT)	LATITUDE (NORTH)	LONGITUDE (WEST)	EST. ERROR (MILES)	DEPTH (METERS)	DIP (DEGREES)	DIP AZIMUTH (DEGREES)
5 SEP	1450	78 37	124 05	2	2120	1.8	290
6	1400	78 31	123 50	6	1705	5.6	170
6	2115	78 33	123 40	6	1745	7.1	170
7	1425	78 36	123 30	7	1875	6.9	150
8	1455	78 37	123 30	7	1900	0.8	30
9	2040	78 36	123 20	8	1775	1.3	320
10	2000	78 32	123 00	6	1425	1.9	330
11	1630	78 29	122 30	4	1225	2.1	330
12	1630	78 28	122 20	2	1115	2.2	330
13	1545	78 26	122 30	3	1070	2.5	330
14	1400	78 26	122 30	4	1080	2.6	320
15	1405	78 25	122 30	6	1075	2.6	320
16	1420	78 22	122 30	7	980	2.5	310
17	1405	78 17	122 00	8	705	5.6	330
17	1435			8	700	5.6	330
18	1835	78 19	122 00	10	805	3.6	320
19	1945	78 18	122 00	10	780	3.9	330
20	1635	78 17	122 00	10	770	4.0	330
20	1730			10	770	4.1	330
27	1620	78 15	122 00	10	710	5.5	320
27	2140	78 14	122 00	10	625	1.5	0
29	1915	78 12	122 00	10	520	1.4	160
1 OCT	1945	78 10	122 00	10	495	1.8	350
3	2045	78 08	122 00	10	480	0.1	230
4	2150	78 08	122 00	10	480	0.4	200
6	1920	78 08	122 00	10	480	0.4	80
6	2000			10	480	0.2	180
8	2125	78 08	122 00	10	500	0.3	340
9	1930	78 08	122 00	10	485	2.2	300
9	2230	78 08	122 00	10	480	2.0	290
11	2050	78 08	122 00	10	490	0.7	310

DATE (1959)	TIME (GMT)	LATITUDE (NORTH)	LONGITUDE (WEST)	DEPTH (METERS)	DIP (DEGREES)	DIP AZIMUTH (DEGREES)
28 SEP	0005	71 14	137 36	1585	2.6	340
30	0030	71 16	137 49	1724	1.7	000
2 OCT	0145	71 23	137 56	2036	1.2	350
4	0205	71 33	138 03	2324	1.4	050
6	0130	71 38	138 09	2202	1.1	350
7	0205	71 38	138 10	2220	3.5	005
10	0230	71 37	138 22	2190	2.2	350
11	0130	71 37	138 30	2209	0.9	355
13	0200	71 38	138 52	2466	1.6	205
16	0530	71 36	139 03	2357	0.6	033
18	0230	71 36	138 53	2336	1.4	020
20	0035	71 33	138 52	2212	0.5	020
22	0210	71 30	139 05	2278	2.8	020
24	0030	71 31	139 23	2408	0.2	300
26	0115	71 29	139 32	2314	0.6	005
29	0200	71 27	139 49	2307	0.6	005
1 NOV	0115	71 17	140 20	2496	0.6	015
3	0140	71 15	140 56	2446	1.6	175
5	0030	71 10	141 05	2484	2.5	155
6	2120	71 08	141 13	2512	3.3	055
8	2120	71 08	141 20	2447	3.3	105
23	2300	71 09	144 20	2142	9.5	335
26	0200	71 08	144 22	2157	7.8	290
27	2000	71 08	144 33	1843	9.7	060
1 DEC	0230	71 10	145 33	2215	18.4	110
2	0210	71 10	145 51	2279	0.4	330
4	0140	71 11	146 15	2166	3.9	125
13	0100	71 05	145 05	1440	9.9	010
16	2320	71 04	145 05	1337	0.2	050
17	1030	71 04	145 05	1337	0.2	050

3.3 Charlie Bathymetry

Depth soundings along the drift track of station Charlie were made during the entire occupation by scientists from the Lamont Geological Observatory. A precision depth recorder (PDR) was operated throughout the drift and registered a continuous graphic profile of the ocean bottom. The attitude of the bottom was determined as an adjunct to the seismic reflection program (Hunkins,¹¹ 1960), which began 17 August 1959 and terminated 6 January 1960.

The PDR, developed at Lamont (Hubbard and Luskin,¹⁰ 1959), recorded depths to precision of one meter. The instrument produced one 1.8 kc ping per min with an acoustic energy of one watt. This instrument has a constant time base corresponding to a sound velocity in water of 800 fms/sec (1463 m/sec). Selected depths taken from the records have been recomputed by this writer using velocities given by Crary and Goldstein⁴ (1957).

The seismic instrumentation and procedures were similar to those employed on Alpha. Twelve vertical 14 cps geophones were planted on the ice in an L-shaped array. The distance between the detectors was approximately 60 m; the total length of each leg, 335 m. The explosive charges were detonated just below the ice-water interface at the junction of the lines. Sound velocities in sea water were taken from Matthews¹⁷ tables (1939) using temperature and salinity data provided by the University of Washington.

DATE (1959)	TIME (GMT)	DEPTH (METERS)
24 JUN	2100	2096
27	0000	2098
27	0300	2096
7 JUL	1400	1556
7	1930	1341
8	0100	1530
8	0800	1237
8	1500	1521
8	2000	1310
9	0900	1053
9	2300	1880
10	1345	624
11	1000	2679
12	0300	2673
12	1230	2377
12	2300	2640
13	1400	2464
14	1300	651
14	1400	606
15	0000	509
15	1400	424
16	0100	388
16	1500	368
17	1600	397
18	0600	335
19	0700	276
19	2300	267
20	2200	261
22	0000	265
23	1500	265
24	1800	267
25	1900	258
26	1700	270
27	1700	263
28	1900	267
30	0800	272
31	1900	265
1 AUG	1900	279
2	1900	292
4	0400	304
4	0500	317
5	0900	304
6	1100	290
7	0100	268
7	1400	304
8	0500	296
8	2200	294
9	1800	274
10	0700	270
12	0500	279
12	2000	261
14	0000	248
14	1800	267
16	0500	270
17	0100	433
17	1000	497
17	1600	497
17	2100	415
18	1000	379

DATE (1959)	LATITUDE (NORTH)	LONGITUDE (WEST)	DEPTH (METERS)	DIP (DEGREES)	DIP AZIMUTH (DEGREES)
17 AUG	77 45	165 32	472	0.8	274
18	77 50	165 35	385	0.6	314
19	77 52	165 49	567	4.5	259
20	77 50	166 12	488	0.6	291
21	77 50	166 30	399	1.3	348
22	77 51	166 42	313	3.7	237
24	77 52	168 00	473	0.9	336
25	77 55	168 36	503	0.6	314
26	77 55	169 02	507	0.8	007
27	78 00	168 47	475	2.9	129
28	77 59	168 14	479	7.3	283
31	77 57	169 11	936	5.1	272
1 SEP	77 53	170 44	1789	3.8	276
3	77 51	171 20	2405	2.7	258
4	77 48	171 35	2437	1.6	292
5	77 46	171 50	2263	0.2	052
6	77 44	172 02	2263	0.4	097
7	77 44	172 08	2253	0.4	098
8	77 45	172 02	2241	0.2	147
9	77 45	171 58	2245	0.3	053
10	77 47	171 52	2253	0.3	325
11	77 52	171 32	2262	1.2	280
12	77 57	171 13	2254	0.3	054
13	78 03	170 53	2107	2.3	356
14	78 06	170 33	2335	1.9	247
15	78 06	170 22	2273	1.8	271
16	78 05	170 29	2359	1.9	229
17	78 06	171 21	2486	5.1	235
19	78 03	172 34	2008	0.8	249
20	78 01	172 39	2188	2.2	336
21	77 58	172 40	2223	0.0	--
23	77 53	172 48	2225	0.4	188
24	77 51	172 52	2171	0.5	114
25	77 48	172 56	2124	2.2	004
26	77 45	172 56	2231	0.2	144
28	77 42	173 20	2155	0.5	151
29	77 48	173 18	2112	1.6	001
30	77 52	173 25	2037	0.7	034
1 OCT	77 52	174 00	1972	2.5	069
2	77 54	174 15	1917	5.0	352
5	77 57	174 17	2035	0.6	302

DATE (1959)	TIME (GMT)	LATITUDE (NORTH)	LONGITUDE (WEST)	DEPTH (METERS)	DIP (DEGREES)	DIP AZIMUTH (DEGREES)	
7	OCT	0515	77 58	174 17	1483	1.2	292
7		0515	77 58	174 17	1482	1.1	285
8		0515	78 00	174 14	2000	0.6	62
8		0515	78 00	174 14	2001	0.9	61
12		0515	78 00	173 53	2012	1.5	226
13		0515	77 57	173 58	2221	0.3	253
13		0515	77 57	173 58	2020	0.1	291
18		0515	77 41	172 20	2277	0.0	--
19		0500	77 36	172 13	2269	0.3	157
19		0515	77 36	172 13	2268	0.6	274
19		0515	77 36	172 13	2268	0.3	68
20		0515	77 31	172 05	2273	0.0	--
21		0515	77 36	171 30	2294	0.4	112
22		0515	77 42	170 51	2266	1.7	320
23		0500	77 43	170 00	2215	0.2	348
23		0515	77 43	170 00	2218	2.4	105
24		0500	77 51	170 07	2292	1.6	307
25		0500	77 55	170 45	2210	1.4	298
26		0515	78 00	171 31	2238	0.0	--
27		0500	77 58	171 42	2238	0.0	--
28		0515	77 56	171 48	2238	0.6	250
28		2330	77 56	171 48	2265	0.3	156
29		0500	77 53	171 49	2263	0.0	--
30		0500	77 50	171 50	2261	0.0	--
31		0500	77 48	171 55	2256	1.2	107
1	NOV	0500	77 43	172 08	2263	0.0	--
2		0500	77 36	172 18	2241	0.0	--
3		0515	77 31	172 09	2241	0.5	338
4		0515	77 36	171 44	2241	1.0	302
5		0515	77 42	171 20	2120	1.7	335
5		0945	77 43	171 10	2135	3.2	325
6		0015	77 42	170 59	2069	6.9	352
7		0500	77 37	171 04	2245	2.2	144
8		0500	77 35	171 10	2100	3.1	110
8		1845	77 33	171 15	2408	0.2	293
9		0515	77 31	171 27	2335	3.7	138
10		0045	77 31	171 36	2262	0.3	340
10		0515	77 31	171 38	2260	0.6	313
11		0515	77 34	171 44	2247	0.4	202
12		0515	77 36	171 49	2274	1.0	285
13		0500	77 40	171 55	2260	0.0	--
14		0500	77 46	172 04	2247	0.4	298
15		0515	77 52	172 16	2236	0.7	282
16		0515	78 00	172 20	2196	0.3	335
17		0500	77 55	172 15	2259	0.4	121
18		0500	77 53	172 12	2235	0.3	122
19		0500	77 51	172 20	2235	0.4	302
19		0500	77 51	172 20	2234	0.5	260
20		0500	77 52	172 30	2236	0.3	343
21		0515	77 53	172 38	2221	0.8	170
22		0515	77 50	172 34	2234	0.3	263
23		0515	77 51	172 36	2226	0.5	351
24		0515	77 52	172 38	2223	0.0	--
25		0515	77 52	172 34	2202	1.1	27
26		0500	77 48	172 24	2226	0.0	--
27		0515	77 43	172 13	2264	0.3	82
28		0500	77 38	172 03	2268	0.4	307
29		0515	77 37	172 11	2260	1.1	354
30		0515	77 38	172 21	2251	0.0	--
1	DEC	0130	77 39	172 43	2237	1.8	55
2		0500	77 38	173 02	2101	1.6	38
3		0515	77 36	173 11	1968	2.3	13
5		0515	77 23	172 13	2237	0.7	267

DATE (1959)	TIME (GMT)	LATITUDE (NORTH)	LONGITUDE (WEST)	DEPTH (METERS)	DIP (DEGREES)	DIP AZIMUTH (DEGREES)
6 DEC	0345	77 17	171 54	2043	3.6	151
6	0700	77 17	171 55	2245	0.4	150
7	0500	77 09	172 02	1926	1.7	16
7	0515	77 09	172 02	2145	0.6	310
9	0500	77 02	172 25	2253	0.0	--
11	0515	76 57	171 14	2233	0.8	312
11	1000	76 57	171 10	2212	0.6	352
11	2345	76 57	171 03	2216	3.5	357
12	0500	76 57	171 07	2175	0.2	311
12	1000	76 57	171 11	2214	0.1	311
12	1515	76 56	171 15	2214	0.5	103
12	2315	76 56	171 21	2216	0.2	7
13	0515	76 56	170 36	2212	0.1	313
13	0945	76 56	170 32	2216	0.3	274
13	1530	76 57	170 24	2216	0.1	311
14	0500	76 57	170 12	2212	0.3	377
14	1000	76 57	170 08	2220	0.7	276
14	1530	76 58	170 14	2212	0.3	133
14	2300	76 59	169 58	2213	0.3	276
15	0500	76 59	169 56	2212	0.1	314
15	1000	76 59	169 54	2215	0.4	315
15	1515	76 59	169 51	2218	0.4	314
16	0100	76 59	169 48	2207	0.6	236
16	0515	77 00	169 44	2193	0.6	236
16	1000	77 01	169 41	2188	0.5	283
16	1530	77 01	169 35	2256	0.4	257
16	2300	77 02	169 28	2127	0.8	210
17	0500	77 02	169 22	2088	1.0	184
17	1000	77 03	169 17	2070	1.0	183
17	1530	77 04	169 11	2037	0.8	201
17	2300	77 04	169 07	1996	0.4	231
18	1000	77 06	169 07	1919	1.9	162
18	1515	77 07	168 58	1844	1.8	311
18	2315	77 08	169 52	2256	1.9	245
19	0515	77 08	168 48	1560	4.9	119
19	1000	77 08	168 43	1436	6.3	212
19	1530	77 07	168 38	1232	8.0	228
20	0000	77 07	168 29	879	5.9	129
20	0500	77 08	168 26	681	2.1	195
20	1000	77 09	168 24	591	2.1	200
20	1530	77 10	168 21	583	1.1	354
20	2345	77 11	168 17	548	0.9	251
21	0500	77 11	168 15	539	0.7	193
21	1000	77 12	168 12	541	0.6	350
21	1530	77 13	168 09	502	1.8	321
21	2315	77 14	168 05	536	0.7	185
22	0515	77 13	168 14	499	1.6	314
22	1000	77 14	168 16	549	5.7	277
22	1515	77 15	168 18	540	1.7	350
22	2330	77 17	168 23	514	3.9	250
23	0500	77 17	168 25	584	1.4	182
23	1000	77 17	168 26	641	3.5	191
23	1545	77 16	168 30	734	3.6	298
23	2315	77 16	168 32	807	4.1	181
24	0500	77 15	168 34	824	4.7	129
24	1000	77 15	168 33	816	4.4	188
24	1530	77 16	168 34	728	2.1	198
24	2315	77 16	168 36	604	2.9	157
25	1100	77 15	168 08	541	0.7	324
26	0515	77 14	167 50	529	1.8	326
26	1530	77 17	167 48	524	1.0	330
26	2345	77 20	167 49	527	1.5	283
27	0500	77 22	167 46	521	0.9	307

DATE (1959)	TIME (GMT)	LATITUDE (NORTH)	LONGITUDE (WEST)	DEPTH (METERS)	DIP (DEGREES)	DIP AZIMUTH (DEGREES)
27 DEC	1030	77 23	167 42	521	1.1	297
27	1515	77 23	167 37	529	0.8	30
28	0515	77 25	167 32	531	0.8	180
28	1030			521	0.3	182
29	1015	77 24	167 39	504	2.0	273
29	1515			542	0.4	309
29	2315			539	0.0	--
30	0500	77 20	167 46	489	2.0	309
30	1115			528	1.2	290
30	1530			487	1.3	292
30	2300			528	1.5	309
31	0500	77 18	167 46	532	1.0	309
31	1030			530	0.6	52
31	1515			531	1.1	309
31	2315			493	1.8	302
1960						
1 JAN	0500			536	0.8	51
1	1015	77 13	167 19	540	1.3	309
1	1515			535	0.6	309
1	2330			540	2.1	307
2	0500	77 14	167 32	535	6.0	353
2	1030			529	1.1	139
2	1530			530	2.9	343
2	2315			529	0.7	43
3	0500	77 12	167 44	530	0.4	94
3	1030			532	0.9	295
3	1545			527	0.3	170
4	0500	77 11	168 00	559	1.1	318
4	1015			582	1.5	298
4	1530	77 12	168 01	651	2.7	226
4	2315			833	4.4	204
5	0500	77 13	168 02	1061	4.1	211
5	1015	77 12	168 06	1175	4.9	221
5	1615	77 09	168 16	1451	7.7	248
6	0500	77 04	168 39	1775	2.2	224
6	1515	77 00	168 47	1984	4.3	193
7	0430	76 55	169 04	2153	1.2	179

4. OCEANOGRAPHY

Serial oceanographic observations were conducted at the US drift stations from 1957 through 1960. Stations were scheduled once per week or when warranted by change of position. At the pack ice stations, the oceanographic shelters were located in the main camp areas; at T-3 (BRAVO), on the fast sea ice near the edge of the island. The advantages of such stable platforms compared to those furnished by a ship in open water are obvious; however, some difficulties were encountered at all stations including maintaining a hole through five to fifteen feet of pack ice at low environmental temperatures, protecting the shelters and access holes from excessive ablation and meltwater run-off, and preventing the freezing of samples and chemicals.

Water samples were obtained with Nansen bottles; temperatures, with one or two protected deep sea reversing thermometers; and sampling depths, from a combination of meter-wheel readings and standard calculations from paired protected and unprotected reversing thermometers. Thermometric and depth computations and dissolved oxygen determinations, as well as most of the spectrophotometric measurements, were made in the field but, with the exception of the T-3 (BRAVO) samples obtained during 1959 and 1960, most of the salinity (chlorinity) determinations were made in fully equipped oceanographic laboratories after the return of the samples to the continental United States or Alaska.

Several of the field investigators have made the following comments regarding field conditions that affected the validity of the data obtained:

- a. Meter-wheel readings were often unreliable especially at low air temperatures;
- b. Temperatures obtained at the surface and in the first few meters of the water column were often anomalous because of heat transferred from stoves used to raise the temperatures in the oceanographic shelters to permissible limits and from abnormal amounts of meltwater which often drained into the hydrographic holes;
- c. Salinity values might have been affected by the long storage periods and the occasional partial freezing and thawing to which many of the samples were subjected;
- d. Thermometer mercury columns often broke at the low air temperatures or when lowered into the cold water from a warm shelter.

The oceanography programs at the various stations were conducted by, or were under the supervision of the investigators and agencies listed in Table 3.

EXPLANATION OF TABLES

Normal shipboard oceanographic procedures were followed whenever possible, but some modifications of these were often necessary to cope with equipment faults and the environment. For example, poor cable condition coupled with a lack of Nansen bottles, thermometers, or both often made it necessary to execute casts in fractions, which were sometimes spread over a period of several days. Except as noted in the introductory comments preceding each series of stations, the following explanation pertains to all of the oceanographic data presented:

<u>STATION NUMBER</u>	Chronological sequence of oceanographic stations. See Table 3.
<u>TIME</u>	Greenwich Mean Time (GMT) of the station.
<u>DEPTH</u>	Ocean depth reported in meters. Depths are from sonic or wire soundings as noted. For echo sounding, the given value represents the shortest straight-line distance to the nearest reflector. Depths have been interpolated between soundings when necessary.
<u>LATITUDE and LONGITUDE</u>	From astronomical observations, with interpolation when necessary.
<u>WEATHER</u>	Reported in standard World Meteorological Organization code. (Temperatures are in degrees Centigrade)
<u>DEPTH OF SAMPLING</u>	In meters. Generally determined by meter wheel. Paired protected and unprotected thermometers when available were used to establish depths. Much of the data has been interpolated to the standard depths.
<u>TEMPERATURE</u>	Measured by one or two calibrated deep-sea protected reversing thermometers.
<u>SALINITY</u> (chlorinity)	Determined by titration using Knudsen's method (with the silver nitrate solutions standardized against "eau de mer normale") or with a salinity bridge. Reported in parts per thousand (‰).
<u>OXYGEN (dissolved)</u>	In milliliters per liter (ml/l). Determinations were made soon after sampling by the Winkler method (Thompson and Robinson, ²² 1939). Saturation percentages (%) were computed by Fox's formula.
<u>SILICATE-SILICON</u> (inorganic dissolved)	Was determined at the field stations by the technique described by Dienert and Wandenbulke ⁵ (1923) employing photoelectric colorimeters. Values are expressed in microgram atoms per liter (mg-A/l).
<u>PHOSPHATE- PHOSPHOROUS</u> (inorganic dissolved)	Content was measured colorimetrically by the method of Robinson and Thompson ¹⁹ (1948a). Results are in microgram atoms per liter (mg-A/l).
<u>TOTAL PHOS- PHOROUS</u>	Was determined by the method given by Ketchum, Corwin, and Keen ¹⁴ (1955) from samples returned to the Woods Hole Oceanographic Institution.
<u>BLANK SPACES</u>	Indicate samples were not taken or were not returned for analysis.

DASHES (----)

Denote observations that were lost or that were considered erroneous and therefore omitted.

ASTERISKS (*)

Indicate depths calculated by means of paired protected and unprotected reversing thermometers.

Table 3

<u>DRIFTING STATION</u>	<u>DATES</u>	<u>OCEANOGRAPHIC STATIONS</u>	<u>INVESTIGATOR AND REFERENCE</u>	<u>ORGANIZATION*</u>	<u>REMARKS</u>
<u>ALPHA</u>	27 July - 20 August 1957	1-2a	M. Davidson	Lamont	Included in Farlow (1958).
	2 Oct. 1957 - 15 April 1958	3-10	J.S. Farlow ⁷ (1958)	WHOI	Station numbering a continuation of the preceding
	3 June - 30 Oct. 1958	11-32	T.S. English ⁶ (1961)	AINA and Univ. Wash.	"
<u>FLETCHER'S ICE ISLAND</u>					
<u>T-3 (BRAVO)</u>	20 June 1957 - 15 May 1958	1-8**	S. Apolonio	WHOI	Included in Farlow (1958) as Stations 12-17
	26 May - 28 Sept. 1958	1-21	A. Collin ² (1959)	FRB	
	9 June 1959 - 5 Sept. 1960	1-35	K. Kusunoki ¹⁵ (1962)	AINA (Hokkaido Univ.)	
<u>CHARLIE</u>	6 June 1959 - 1 Jan. 1960	1-37**	J. Gast ⁹ (1960)	Univ. Wash.	Appeared as ALPH II Stations 1-25 and CHARLIE I Stations 2a-12b in original tabulation.

* See Table 1 for abbreviations

** Numbering used in the present report

4.1 Alpha Oceanography

Stations 1-10

Start of Observation - the date and time at which the first series of the station started down.

End of Observation - the date and time at which the last series of the station was completed.

Depth - the sonic ocean depth, usually measured once per day. Wire soundings are indicated by "Read from the meter wheel."

Salinity (S) - was determined on a Mark I Salinometer (Schleicher and Bradshaw,²¹ 1956) at the Woods Hole Oceanographic Institution. An accuracy of $\pm 0.005^\circ/\text{oo}$ is usually realized by this instrument. Discrepancies are thought to be the result of the long storage period and the large temperature fluctuations to which the samples were subjected.

Oxygen - sample handling might have reduced the usual accuracy of $\pm 3\%$.

Question Marks (?) - indicate data of questionable accuracy.

Stations 11-32

Date and Time - based on Alaskan Standard Time (AST = GMT-10 hours).

Stations were started at approximately 0900 AST and were completed at approximately 1700 AST.

Depth - ocean depth from seismic soundings.

Depth (of sampling) - read from the meter wheel.

Temperature - derived from the mean of the readings from two protected reversing thermometers. Some of the instruments were in poor condition and malfunctioned frequently. Obvious discrepancies have been omitted. An asterisk (*) denotes a temperature measured with a single thermometer.

Salinity - was determined by Knudsen titration at the Woods Hole Oceanographic Institution. Samples were stored in glass bottles with screw caps which had attached plastic cones to effect seals.

Phosphate-Phosphorous (inorganic dissolved) - a factor of 1.19 was employed throughout to correct for the salt error.

Nitrate-and Nitrate-Nitrogen - samples were analyzed with a photoelectric colorimeter on the drift station by the method developed by Mullin and Riley¹⁸ (1955). No correction was made for salt error.

STATION 1

	<u>Date</u>	<u>Time</u>	<u>Latitude</u>	<u>Longitude</u>
Start of Obs.	7/27/57	0930	82° 59' N	167° 22' W
End of Obs.	7/31/57	0840	83° 05' N	167° 19' W
<u>Depth</u> 3233 m.	1/28/57	0615		

Depth m	T °C	S o/oo	O ₂ ml/l	Total P ug at/l
0	+0.71	<1	8.37	1.61
1.5	+0.18	<1.8	8.48	0.23
3	-0.08	31.062	8.57	1.37
5	-1.58	31.150	8.59	1.39
10	-1.64	31.168	8.60	1.29
20	-1.65	31.208	8.64	1.47
30	-1.62	31.246	8.64	1.43
50	-1.68	31.260	8.55	1.47
60	-1.59	31.593	7.80	1.29
75	-1.27	32.384	6.64	1.78
85	-1.20	32.624	6.36	1.64
100	-1.40	32.834	6.51	1.89
150	-1.29	33.689	6.06	1.75
200	-1.07	34.343	6.84	0.82
250	-0.42	34.570	6.77	----
300	+0.13	34.738	6.66	0.96
350	+0.39	34.243	6.72	0.90
400	+0.49	34.865	6.77	0.99
450	-1.56	34.867	6.83	0.99
450	+0.47	34.864	6.85	0.87
475	+0.50	34.872	6.70	0.88
500	+0.44	34.856	6.82	0.95
600	+0.21	34.884	6.87	0.99
600	+0.28	34.878	6.85	0.86
700	+0.17	34.857	6.87	0.96
800	+0.09	34.903	6.89	0.94
1000	-0.08	34.923	6.75	0.87
1200	-0.15	34.982	6.57	1.02
1500	-0.32	34.939	6.62	0.99
2000	-0.42	34.966	6.52	0.97
2500	-0.37	34.959	6.62	1.03
3000	-0.34	34.955	6.61	1.04
3162	-0.40	34.957	6.65	1.17

STATION 2

	<u>Date</u>	<u>Time</u>	<u>Latitude</u>	<u>Longitude</u>
Start of Obs.	8/15/57	0302	84° 06' N	166° 18' W
End of Obs.	8/17/57	1810	84° 10' N	166° 27' W
Depth 1612 m.	8/14/57	2000		

Depth m	T °C	S o/oo	O ₂ ml/l	Total P ug at/l
1.5	-1.09	33.069	8.37	0.66
5	-1.61	33.153	8.44	0.74
10	-1.64	33.228	8.11	0.83
20	-1.64	33.292	8.55	1.04
30	-1.64	33.382	8.55	1.42
40	-1.68	33.449	8.23	1.46
50	-1.68	33.577	8.32	1.39
60	-1.47	32.617	7.38	1.57
75	-1.26	32.667	6.73	1.77
85	-1.30	32.772	6.36	1.87
100	-1.63	32.817	6.21	2.05
125	-1.51	32.900	6.14	2.18
150	-1.29	32.918	6.40	1.33
175	-1.15	32.996	6.77	0.78
200	-0.98	31.764	6.68	0.87
250	-0.09	32.040	6.41	0.92
300	+0.22	32.179	6.56	0.89
350	+0.37	32.292	6.69	0.96
400	+0.45	32.386	6.86	0.97
450	+0.49	32.487	6.81	0.90
475	+0.49	32.572	6.81	0.94
530	+0.43	34.889	6.32	0.70
630	+0.25	34.884	6.64	0.82
730	+0.15	34.940	6.64	0.96
930	+0.02	34.914	6.66	0.93
1130	-0.14	34.925	6.84	1.02
1430	-0.38	34.950	6.69	1.17
1520	-0.43	34.945	6.66	1.12

Salinity sample numbers on log sheet were probably out of order.
Casts were made in reverse order (i. e., deepest first).

STATION 2a

	<u>Date</u>	<u>Time</u>	<u>Latitude</u>	<u>Longitude</u>
Start of Obs.	8/20/57	1015	84°12' N	168°33' W
End of Obs.	8/20/57	1315	84°12' N	168°33' W
Depth 2315 m.	8/19/57			

1200	-0.21	33.692	5.38	0.23
1500	-0.34	33.785	6.22	0.15
2000	-0.41	33.926	5.77	0.10
2300	-0.39	-----	6.50	0.86

Salinity, oxygen and phosphorus values are dubious.

STATION 3

	<u>Date</u>	<u>Time</u>	<u>Latitude</u>	<u>Longitude</u>
Start of Obs.	10/2/57	0045	85°20' N	172°40' W
End of Obs.	10/4/57	0330		
Depth 1821 m.	10/4/57	0500		

Depth m	T °C	S o/oo	O ₂ ml/l	Total P ug at/l
2	-1.67	30.694		1.51
4	-1.68	30.820		1.46
9*	-1.68	30.838		1.47
18	-1.68	30.874		1.38
27	-1.69	30.640		1.22
36	-1.69	31.204		1.47
45*	-1.58	31.676		----
60	-1.40	32.354		1.96
75	-1.42	32.852		1.92
90	-1.49	33.224		1.91
110	-1.38	33.826		1.11
125	-1.40	34.096		0.79
150	-1.34	34.272		----
175	-0.98	34.410		0.73
200	-0.58	34.524		0.73
250	-0.06	34.684		0.83
300	-----	34.263?		1.73
350	0.51?	34.853		1.72
395*	0.48	34.861		0.78
444	0.50	34.870		0.74
494	0.49	34.884		0.80
592	0.29	34.894		0.82
795*	0.07	34.906		0.68
994	-0.13	34.915		0.81
1192	-0.23	34.928		0.96
1491	-0.38	34.941		0.96
1789	-----	34.178?		0.77

STATION 4

	<u>Date</u>	<u>Time</u>	<u>Latitude</u>	<u>Longitude</u>
Start of Obs.	10/23/57	2014	85°01.5' N	170°33' W
End of Obs.	10/24/57	0543		
Depth 1420 m.	10/24/57	0315		

Depth m	T °C	S o/oo	O ₂ ml/l	Total P ug at/l
2	-1.62	30.843		1.29
5	-1.69	30.854		1.34
10	-1.68	30.851		1.45
21	-1.70	30.850		1.38
31*	-1.69	30.861		1.36
40*	-1.65	30.878		1.15
51	-1.46	32.019		1.57
76	-1.37	32.722		1.81
101	-1.53	33.234		2.00
126*	-1.30	33.905		1.18
147*	-1.30	34.216		0.82
172	-0.73	34.434		0.88
196	-0.56	34.607		0.85
246	-0.02	34.709		0.95
265	0.14	34.772		1.13
296*	0.30	34.816		0.97
345	0.46	34.859		0.96
395	0.47	34.869		1.07
493	0.41	34.889		1.15
607*	0.25	34.906		0.76
810	0.00	34.903		0.87
1012	-0.16	34.929		0.89
1214	-0.34	34.942		1.03
1417*	-0.41	34.947		0.88

STATION 5

	<u>Date</u>	<u>Time</u>	<u>Latitude</u>	<u>Longitude</u>
Start of Obs.	11/14/57	1842	84°17' N	167°24' W
End of Obs.	11/19/57	0312	84°24.9' N	165°50' W
<u>Depth</u> 2346 m.	11/19/57	0515		

Depth m	T °C	S o/oo	O ₂ ml/l	Total P ug at/l
1	-1.70	30.938		1.37
4	-1.72	31.003		1.34
9	-1.71	31.008		1.40
18*	-1.70	31.012		1.35
27*	-1.68	31.020		1.34
40*	-1.68	31.023		1.17
50*	-1.54	31.601		1.29
76	-1.29	32.586		1.88
101	-1.42	32.966		2.14
126	-1.51	33.342		2.00
150	-1.27	33.904		1.21
175	-1.24	34.260		0.84
200	-1.04	34.398		0.83
250*	-0.31	34.604		0.79
301*	0.18	34.777		0.76
351	0.34	34.829		0.85
401	0.42	34.871		0.88
501	-----	34.888		0.88
601*	0.28	34.895		0.83
802*	0.07	34.911		0.81
1000	-0.09	34.927		0.91
1199	-0.20	34.936		0.95
1499	-0.35	34.946		0.89
1999*	-0.41	34.966		0.82
40	-1.70			
50	-1.66			
260	-0.13			
2200*	-0.39	34.965		0.96
2220*	-0.39	34.972		0.88

STATION 5a

	<u>Date</u>	<u>Time</u>	<u>Latitude</u>	<u>Longitude</u>
Start of Obs.	11/26/57	0553	83°47.5' N	165°46' W
End of Obs.	11/26/57	0710		
<u>Depth</u> 3018 m.	11/26/57	0515		

2002	-0.40	34.972	0.86
2503	-0.38	34.974	0.98
2758*	-0.37	34.957	0.91
2978	-0.35	34.978	1.00

STATION 6

	<u>Date</u>	<u>Time</u>	<u>Latitude</u>	<u>Longitude</u>
Start of Obs.	12/2/57	2013	83°41.5' N	164°40' W
End of Obs.	12/4/57	2241	83°40.3' N	164°06' W
Depth 2804 m.	12/4/57	1915		

Depth m	T °C	S o/oo	O ₂ ml/l	Total P ug at/l
2	-1.69	31.126		1.06
5	-1.72	31.160		1.00
10	-1.70	31.167		1.00
20	-1.70	31.165		0.99
30	-1.70	31.163		1.08
46	-1.69	31.168		1.14
57	-1.72	31.168		1.65
88	-1.30	32.374		1.42
114	-1.61	32.816		1.65
143	-1.48	-----		1.69
152	-1.31	33.551		1.56
177	-1.32	34.095		0.92
203	-1.11	34.327		-----
253	-0.29	34.600		0.77
304*	0.18	34.777		0.85
401	0.45	34.869		0.83
502	0.42	34.886		0.81
602	0.26	34.900		0.77
802	0.08	34.911		0.88
1003*	-0.05	34.931		0.94
1205	-0.16	34.945		0.68
1506	-0.34	34.955		0.63
2008	-0.42	34.963		0.72
2510*	-0.38	34.969		0.70
351	0.32	34.821		0.78
2704*	-0.36	34.975		0.85
2754*	-0.36	34.975		0.93

STATION 7

	<u>Date</u>	<u>Time</u>	<u>Latitude</u>	<u>Longitude</u>
Start of Obs.	12/14/57	0107	83°48.6' N	165°05' W
End of Obs.	12/20/57	0838	83°33.0' N	162°42' W
Depth 2312 m.	12/20/57	0515		

Depth m	T °C	S o/oo	O ₂ ml/l	Total P ug at/l
2	-1.66	31.085		1.15
5	-1.71	31.067		1.21
10	-1.70	31.063		1.18
21*	-1.70	31.060		1.12
32	-1.69	31.090		1.08
40	-1.69	31.159		1.10
50	-1.71	31.191		1.01
75	-1.28	32.513		1.62
100*	-1.40	32.918		1.72
126*	-1.42	33.368		1.74
149	-1.22	33.751		1.70
174	-1.29	34.105		1.03
198	-1.24	34.285		0.83
248*	-0.91	34.453		0.79
298*	-0.58	34.579		0.83
401	0.39	34.817		0.65
501	0.48	34.871		0.73
602	0.37	34.895		0.72
802*	0.10	34.930		0.70
1003*	-0.04	34.928		0.65
350	0.35	34.808		0.66
1199	-0.20	34.937		0.63
1498	-0.35	34.955		0.68
1998*	-0.42	34.953		0.83
2269*	-0.40	34.967		0.83

STATION 8

	<u>Date</u>	<u>Time</u>	<u>Latitude</u>	<u>Longitude</u>
Start of Obs.	3/29/58	2034	83°48' N	152°22' W
End of Obs.	3/30/58	2200	83°47. 6' N	152°30' W
<u>Depth 2694 m.</u>	3/30/58	1925		

Depth m	T °C	S o/oo	O ₂ ml/l	Total P ug at/l
3	-1.68	31.265	8.12	1.05
5	-1.74	31.243	8.13	0.92
10	-1.71	31.238	8.15	0.98
19	-1.70	31.248	8.09	1.09
29*	-1.71	31.248	8.03	0.99
41	-1.70	31.267	7.92	0.90
52	-1.74	31.277	7.95	0.92
77	-1.38	31.982	6.45	1.40
103	-1.29	32.520	5.98	1.54
129*	-1.38	32.890	5.81	1.68
152	-1.47	33.356	5.96	1.83
177	-1.27	33.649	5.76	1.59
202	-----	34.188	5.80	1.31
252	-0.26	34.559	6.02	0.96
303*	0.12	34.745	6.06	0.83
348	0.31	34.815	6.11	0.92
398	0.39	34.845	6.15	0.91
497	-----	34.865	6.15	0.96
596	0.24	34.885	6.15	0.94
795*	0.07	34.902	6.15	1.00
1000	-0.04	34.911	6.15	0.89
1200	-0.18	34.939	6.12	0.87
1500	-----	34.943	6.06	0.85
2000	-0.41	34.956	5.85	0.82
2650	-0.38	34.939	5.68	0.91

STATION 9

	<u>Date</u>	<u>Time</u>	<u>Latitude</u>	<u>Longitude</u>
Start of Obs.	4/3/58	2130	83°47.8' N	151°31' W
End of Obs.	4/11/58	0208	83°45.8' N	151°48' W
<u>Depth</u> 2876 m.	4/11/58	0400		
2871 m.	4/11/58	0100		

(Read from Meter Wheel)

Depth m	T °C	S o/oo	O ₂ ml/l	Total P ug at/l
5	-1.69	31.264	8.24	
10	-1.72	31.279	8.19	
15	-1.71	31.254	8.20	
20	-1.71	31.236	8.20	
25	-1.71	31.254	8.18	
30	-1.67	31.243	8.18	
35	-1.72	31.259	8.18	
40	-1.71	31.268	8.17	
45	-1.70	31.264	8.18	
50	-1.71	31.275	8.18	
55	-1.67	31.282	8.15	
60	-1.72	-----	8.10	
65	-1.68	-----	7.90	
70	-1.44	31.764	6.91	
75	-1.35	32.040	6.48	
80	-1.31	32.179	6.31	
85	-1.31	32.292	6.10	
90	-1.28	32.386	5.94	
95	-1.28	32.487	5.94	
100	-1.30	32.572	5.84	
105	-1.30	32.617	5.99	
110	-1.34	32.667	5.94	
115	-1.36	32.772	5.92	
120	-1.37	32.817	5.92	
125	-1.37	32.900	5.86	
130	-1.38	32.918	5.86	
135	-1.45	32.996	5.82	
140	-1.45	33.069	5.79	
145	-1.47	33.153	5.79	
150	-1.46	33.228	5.81	
155	-1.46	33.292	5.87	
160	-1.46	33.382	5.85	
165	-1.39	33.449	5.74	
170	-1.3.	33.577	5.71	
175	-1.25	33.692	5.64	
180	-1.19	33.785	5.64	
185	-1.16	33.926	5.61	
190	-1.07	-----	5.63	
195	-1.02	34.085	5.70	
200	-0.91	34.171	5.71	

STATION 2 (Continued)

	<u>Date</u>	<u>Time</u>	<u>Latitude</u>	<u>Longitude</u>
Start of Obs.	4/3/58	2130	83°47.8' N	151°31' W
End of Obs.	4/11/58	0208	83°45.8' N	151°48' W
<u>Depth</u> 2876 m.	4/11/58	0400		
2871 m.	4/11/58	0100		(Read from Meter Wheel)

Depth m	T °C	S o/oo	O ₂ ml/l	Total P ug at/l
205	-0.81	34.250	5.82	
210	-0.75	34.301	5.92	
215	-0.63	34.333	5.92	
220	-0.58	34.385	5.96	
225	-0.55	34.411	5.97	
230	-0.36?	34.444	5.87	
235	-0.41	34.465	5.91	
240	-0.37	-----	5.89	
245	-0.31	34.521	5.87	
250	-0.28	34.546	5.89	
260	-0.17	34.586	5.94	
270	-0.08	34.624	6.00	
280	-0.01	-----	6.00	
290	0.04	34.685	5.99	
300	0.08	34.711	6.02	
310	0.20	34.740	6.07	
320	0.22	34.759	6.10	
330	0.25	34.783	6.12	
340	0.29	34.807	6.14	
350	0.29	34.816	6.17	
360	0.30	34.807	6.14	
370	0.33	34.823	6.14	
380	0.36	34.838	6.17	
390	0.39	34.853	6.19	
400	0.33?	34.850	6.19	
410	0.40	34.852	6.19	
420	0.39	34.856	6.19	
430	0.40	34.855	6.19	
440	0.40	34.865	6.19	
450	0.42	34.870	6.19	
460	0.43	34.872	6.23	
470	0.43	34.867	6.19	
480	0.43	34.875	6.19	
490	0.41	34.871	6.19	
500	0.40	34.867	6.19	
510	0.40	34.867	6.08	
520	0.38	34.872	6.04	
530	0.37	34.877	6.09	
540	0.34	34.875	6.12	
550	0.32	34.876	6.16	
2840	-0.35	34.965	5.72	0.96
2845	-0.34	34.976?	5.71	0.92
2848	-0.34	34.961	5.74	1.04
2850	-0.35	34.964	5.76	0.91

STATION 10
Part 1

	<u>Date</u>	<u>Time</u>	<u>Latitude</u>	<u>Longitude</u>
Start of Obs.	4/14/58	0053	83°52.4' N	151°58' W
End of Obs.	4/15/58	0923	83°52.4' N	151°55' W
<u>Depth</u> 2727 m.	4/14/58	0410		
2734 m.	4/14/58	0610		

(Read from Meter Wheel)

Depth m	T °C	S o/oo	O ₂ ml/l	Total P ug at/l
305	0.14	34.733	5.40	0.86
406	0.41	34.858	5.51	0.88
457	-----	34.877	5.49	0.83
508	0.41	34.865	5.65	0.86
559*	0.34	34.873	5.62	0.86
602	0.27	34.883	6.11	0.86
802	0.08	34.911	6.07	0.89
1003	-0.05	34.918	5.99	0.91
1204	-0.17	34.930	6.05	0.91
1505*	-0.33	34.984	6.02	0.92
2012	-0.41	34.954	5.84	0.95
2515	-0.38	34.966	5.64	1.02
2740*	-0.37	34.961	5.64	1.01
2745	-0.36	34.962	5.73	0.96
2747	-0.36	34.960	5.72	0.98

Part 2

3	-1.71	31.246	7.67	1.02
5	-1.74	31.258	7.75	1.03
10	-1.71	31.253	7.62	1.03
20	-1.71	31.276	7.69	0.95
30*	-1.72	31.253	7.68	0.93
42	-1.66	31.270	8.02	0.96
52	-1.73	31.276	7.97	0.96
62	-1.70	31.292	7.88	1.00
78	-1.36	32.032	6.43	1.47
104*	-1.31	32.536	5.84	1.67
128	-1.37	32.908	5.79	1.72
163	-1.46	33.392	5.72	1.77
189	-1.14	33.942	5.41	1.30
204	-0.93	34.185	5.47	1.11
255*	-0.27	34.580	5.64	0.95
304	0.14		5.50	
406	-----		5.60	
456	0.42		5.60	
507	0.41		5.66	
558*	0.32		5.66	
602	0.26		6.01	
802	0.08		6.03	
1003	-0.06		5.94	
1204	-0.17		5.95	
1505*	-0.33		5.94	

STATION 11

Date 6/3
Depth 2656 m

Latitude 83° 57.4' N
Longitude 151° 27' W

Depth m	T °C	S o/oo	O ₂ ml/l	Total P ug A/l	PO ₄ ug A/l	SiO ₄ ug A/l	NO ₃ ug A/l	NO ₂ ug A/l
5	-1.68*	31.14	8.54					
10	-1.72*	31.15	8.54					
20	-1.73*	31.15	8.50					
30	-1.70*	31.13	--					
50	--	31.14	8.69					
60	--	32.13	7.70					
75	-1.35*	32.51	6.51					
100	-1.33*	33.23	6.12					
150	-1.52	34.26	5.96					
200	-0.84	34.57	5.86					
250	--	34.74	6.02					
300	--	34.83	6.39					
400	0.42*	34.86	6.18					
500	0.36	34.86	6.20					
600	0.20*	34.87	6.22					
700	0.15*	34.91	6.22					
800	0.00	34.96	6.62					
1000	-0.06*	--	6.05					
1200	-0.24	34.88	6.19					
1500	-0.34	34.95	6.02					
2000	--	34.95	6.03					
2500	-0.45	34.95	6.30					
2660	--	34.94	6.08					

STATION 12

Date 6/10
Depth 2645

Latitude 83° 11.5' N
Longitude 149° 27' W

5	-1.67*	31.14	8.74
10	-1.74*	31.15	8.61
20	-1.76*	31.15	8.44
30	--	31.16	8.43
50	-1.78*	31.15	8.51
75	-1.36*	32.08	6.79
100	-1.34*	32.53	6.22
150	-1.50	33.22	--
200	--	34.18	--
300	0.08	34.70	--
400	0.32	34.82	--
500	0.37*	34.86	6.34
600	0.24*	34.88	6.39
800	0.04	34.90	6.32
1000	-0.08	34.91	6.19
1200	-0.20*	34.92	6.18
1500	-0.43	34.96	6.45
1850	-0.41*	34.96	6.47

STATION 13

Date 6/17
Depth 1732

Latitude 84° 30.9' N
Longitude 147° 59' W

Depth m	T °C	S o/oo	O ₂ ml/l	Total P ug A/l	PO ₄ ug A/l	SiO ₄ ug A/l	NO ₃ ug A/l	NO ₂ ug A/l
5	-1.70*	31.23	8.45	0.99				
10	-1.74	31.23	8.47	1.44				
20	-1.74*	31.23	8.26	0.98				
30	--	31.23	8.28	1.04				
50	--	31.21	8.45	1.05				
75	-1.33*	32.11	6.58	1.61				
100	-1.38	32.49	6.25	1.88				
150	-1.48*	33.22	6.13	1.76				
200	-0.95*	34.12	5.88	1.24				
300	0.07	34.70	6.19	0.94				
400	--	34.83	6.48	0.99				
500	0.39*	34.87	6.34	0.91				
600	0.24*	34.86	6.26					
800	0.09*	34.86	6.16					
1000	-0.12*	34.89	6.01					
1200	--	34.91	5.98					
1500	--	34.92	6.30					
1650	--	34.89	5.93					

STATION 14

Date 6/24
Depth 1886

Latitude 84° 39' N
Longitude 147° 38' W

5	-1.68*	31.21	8.49	1.04
10	--	31.21	8.54	1.06
20	-1.69*	31.22	8.44	1.05
30	-1.73*	31.21	8.42	1.03
50	-1.72	31.26	8.47	1.04
75	-1.34	32.09	6.62	1.40
100	-1.32	32.54	6.24	0.99
150	-1.48	33.22	6.12	1.71
200	-0.97	34.17	6.14	--
300	--	34.68	6.25	0.88
400	--	34.81	6.50	1.11
500	0.36*	34.80	6.54	0.93
600	0.24	34.85	6.28	
800	0.03	34.90	6.28	
1000	-0.11	34.91	6.27	
1200	-0.21*	34.92	5.96	
1500	--	34.88	5.82	
1825	--	34.88	6.43	

STATION 15

Date 7/1
Depth 1902

Latitude 84° 41.4' N
Longitude 147° 35' W

Depth m	T °C	S o/oo	O ₂ ml/l	Total P ug A/l	PO ₄ ug A/l	SiO ₄ ug A/l	NO ₃ ug A/l	NO ₂ ug A/l
5	-1.66*	31.22	8.40		1.11			
10	-1.66	31.23	8.26		1.02			
20	--	31.29	8.07		1.09			
30	-1.70	31.22	8.46		1.00			
50	--	31.71	7.54		1.34			
75	-1.45	32.20	6.72		1.69			
100	-1.30	32.38	6.44		1.88			
150	--	33.22	6.13		2.03			
200	--	--	--		1.11			
300	0.10*	34.75	6.21		0.81			
400	0.30*	34.88	6.24		0.86			
500	0.35	34.87	6.26		0.92			
600	0.18	34.89	6.20		0.84			
800	--	34.98	6.20		0.92			
1000	-0.08	34.96	6.58		0.83			
1200	-0.19	34.96	6.61		0.92			
1500	--	35.00	6.41		0.95			
1875	--	34.92	6.51		0.88			

STATION 16

Date 7/8
Depth 2310

Latitude 84° 32.4' N
Longitude 146° 12' W

5	-1.61*	31.16	8.66	0.86
10	-1.63*	31.18	8.64	0.84
20	-1.68*	31.21	8.57	0.87
30	-1.70*	31.24	8.44	0.89
50	-1.68	31.30	8.55	0.95
75	-1.35*	32.08	6.85	1.49
100	--	32.49	6.34	1.59
150	-1.44	32.48	6.40	1.59
200	--	33.23	6.24	1.71
300	0.04*	34.72	6.32	0.75
400	--	34.91	6.37	0.75
500	--	34.89	6.32	0.78
600	--	34.91	6.38	--
800	0.10	34.92	6.60	0.76
1000	-0.06	34.94	6.67	0.84
1200	--	34.92	6.51	0.87
1500	-0.31*	34.98	6.57	0.84
2000	-0.29*	34.97	6.54	0.83

STATION 17

Date 7/15
Depth 2156

Latitude 84° 31.5' N
Longitude 143° 28' W

Depth m	T °C	S o/oo	O ₂ ml/l	Total P ug A/l	PO ₄ ug A/l	SiO ₄ ug A/l	NO ₃ ug A/l	NO ₂ ug A/l
5	--		8.79		0.72			
10	-1.64*		8.73		0.70			
20	-1.66		8.36		0.89			
30	--		8.44		0.87			
50	-1.68		8.59		0.86			
75	-1.30		6.72		1.52			
100	--		6.24		1.45			
150	-1.44		6.19		1.57			
200	--		6.25		1.48			
300	--		6.46		0.69			
400	0.37*		6.53		0.70			
500	0.33*		6.55		0.76			
600	--		6.54		0.76			
800	0.09		6.69		0.76			
1000	-0.05		6.70		0.90			
1200	--		6.60		0.81			
1500	-0.27*		6.53		0.81			
2000	-0.38*		6.52		0.87			

STATION 18

Date 7/22
Depth 2158

Latitude 84° 40.8' N
Longitude 140° 26' W

5	-1.62*		8.74		0.98			
10	-1.65*		8.74		0.88			
20	-1.69*		8.73		0.89			
30	--		8.58		0.92			
50	-1.64		8.30		0.89			
75	-1.28		6.77		1.33			
100	--		6.50		1.42			
150	--		6.25		1.48			
200	--		6.13		1.49			
300	0.02		6.39		0.72			
400	0.38*		6.54		0.74			
500	0.33		6.55		0.72			
600	--		6.56		0.68			
800	0.10		6.63		0.68			
1000	-0.05*		6.70		0.72			
1200	--		6.64		0.71			
1500	--		6.58		0.71			
2000	-0.34		6.50		0.77			

STATION 19

Date 7/29
Depth 1817

Latitude 85° 01.5' N
Longitude 138° 00' W

Depth m	T °C	S o/oo	O ₂ ml/l	Total P ug A/l	PO ₄ ug A/l	SiO ₄ ug A/l	NO ₃ ug A/l	NO ₂ ug A/l
5	-1.68*	31.16	8.80		0.75			
10	-1.60*	31.17	8.81		0.77			
20	-1.68*	31.19	8.72		0.76			
30	-1.63*	31.26	8.67		0.81			
50	-1.68	31.52	8.42		0.89			
75	-1.29	32.17	6.80		1.34			
100	--	32.57	6.47		1.45			
150	-1.47*	33.14	6.19		1.62			
200	-0.96*	34.07	6.12		1.06			
300	0.09*	34.72	6.36		0.64			
400	--	--	6.51		0.65			
500	--	34.80	6.50		0.69			
600	--	34.85	6.57		0.69			
800	--	34.87	6.64		0.83			
1000	--	34.88	6.67		0.74			
1200	--	34.88	6.62		0.72			
1500	--	34.92	6.58		0.74			
1850	-0.31*	34.96	6.53		0.74			

STATION 20

Date 8/5
Depth 2073

Latitude 85° 03.0' N
Longitude 138° 53' W

5	-1.60*	31.03	8.94
10	--	31.04	9.02
20	-1.61*	31.12	8.89
30	-1.61*	31.24	8.78
50	-1.68*	31.48	8.42
60	--	31.53	8.42
75	-1.30	32.13	6.84
100	-1.34*	32.58	6.47
150	-1.47*	33.23	6.21

STATION 21

Date 8/12
Depth 1966

Latitude 84° 58' N
Longitude 136° 05' W

5	-1.60	31.18	8.96	0.81	4	0.5	0.01
10	-1.58	--	8.94	0.57	4	--	--
20	-1.62	31.17	8.90	0.84	4	0.7	0.04
30	-1.58	31.34	8.86	1.07	8	1.0	0.04
50	-1.67*	31.52	8.58	1.04	9	1.7	0.04
60	-1.69	31.64	8.49	1.14	4	2.0	0.04
75	--	32.02	7.00	1.32	14	5.2	0.03
100	-1.31*	32.55	6.45	1.69	--	6.0	0.01
150	-1.46*	33.61	6.14	1.73	25	9.2	0.01
lead surface			0.33	0.06	0	0	0
pond surface			0.11	0.11	0	0	0

STATION 22

Date 8/19
Depth 1898

Latitude 85° 02' N
Longitude 134° 32' W

Depth m	T °C	S o/oo	O ₂ ml/l	Total P ug A/l	PO ₄ ug A/l	SiO ₄ ug A/l	NO ₃ ug A/l	NO ₂ ug A/l
5	-1.60		8.84		1.00	4	0.8	0.08
10	-1.64		8.82		0.98	4	0.4	0.06
20	-1.64		8.80		1.00	4	0.5	0.04
30	-1.62*		8.68		0.98	4	0.5	0.01
40	--		8.54		1.02	3	1.0	0.01
50	-1.68*		8.50		1.05	5	1.2	0.01
60	-1.70		8.46		1.05	6	0.9	0.01
70	--		8.19		1.14	6	1.3	0
80	-1.28*		6.75		1.45	15	3.8	0
90	--		6.64		1.57	25	3.4	0
100	--		6.69		1.64	18	6.2	0
125	--		6.22		1.71	22	9.6	0
150	--		6.18		1.83	25	7.9	0
175	--		5.98		1.64	24	6.1	0
200	--		6.41		1.17	12	5.9	0
250	-0.28		6.41		0.83	5	5.1	0
300	-0.06		6.48		0.81	4	5.3	0
350	0.25		6.54		0.81	3	7.9	0
400	0.32		6.55		0.83	3	5.8	0

STATION 23

Date 8/26
Depth 1703

Latitude 85° 04.8' N
Longitude 130° 40' W

5	-1.61		8.86		0.98	6	0.7	0.05
10	--		8.80		0.98	6	0.6	0.05
20	-1.64		8.79		0.98	5	0.6	0.05
30	-1.67*		8.67		1.03	6	1.0	0.06
40	--		8.54		1.14	5	1.4	0.04
50	-1.69		8.38		1.14	4	1.7	0.03
60	-1.69		8.47		1.17	6	1.8	0.03
70	--		--		--	7	--	--
80	-1.31*		6.63		1.76	19	7.4	0.04
90	--		6.60		1.76	25	5.6	0.02
100	--		6.54		1.88	20	7.8	0
125	--		6.31		2.02	23	8.7	0
150	-1.46*		6.23		2.00	27	10.7	0
175	-1.30*		6.07		1.74	21	10.0	0
200	-0.99		6.28		1.09	9	7.6	0
250	-0.31*		6.49		0.93	6	6.7	0
300	--		6.49		0.86	4	8.0	0
350	0.26		6.62		0.90	4	8.4	0
400	0.36*		6.62		0.88	4	8.5	0

STATION 24

Date 9/2
Depth 1761

Latitude 85° 26.5' N
Longitude 128° 16' W

Depth m	T °C	S o/oo	O ₂ ml/l	Total P ug A/l	PO ₄ ug A/l	SiO ₄ ug A/l	NO ₃ ug A/l	NO ₂ ug A/l
5	-1.65*		8.83					
10	-1.68		8.82					
20	-1.67*		8.82					
30	-1.63*	31.19	8.89					
50	-1.68*	31.52	8.54					
75	-1.35*		6.97					
100	--		6.58					
150	-1.44*		6.28					
200	-0.85*		6.38					
250	-0.19*		6.58					
300	0.06		6.46					

STATION 25

Date 9/9
Depth 2200

Latitude 85° 54' N
Longitude 124° 00' W

5	-1.68		8.74
10	-1.68		--
20	-1.69		8.85
30	-1.66		8.77
50	-1.70		8.58
75	-1.34*		6.80
100	-1.32		6.45
150	--		6.18
200	-0.89*		6.45
250	-0.22		6.59
300	--		6.58

STATION 26

Date 9/16
Depth

Latitude 85° 53.5' N
Longitude 123° 02' W

5	-1.70		8.79
10	-1.68		8.82
20	-1.68*		8.46
30	-1.68		8.89
40	-1.68		8.71
50	-1.72*		8.60
60	-1.68		8.36
70	-1.45		8.40
80	-1.28*		8.42
100	-1.30		6.57
150	-1.44		6.33
200	--		6.62

STATION 27

<u>Date</u>		9/24		<u>Latitude</u>		85° 47.8' N		
<u>Depth</u>				<u>Longitude</u>		120° 29' W		
Depth m	T °C	S o/oo	O ₂ ml/l	Total P ug A/l	PO ₄ ug A/l	SiO ₄ ug A/l	NO ₃ ug A/l	NO ₂ ug A/l
5	-1.68*		8.92					
10	-1.67		8.81					
20	-1.68		8.74					
30	-1.70*		8.90					
40	-1.69*		8.72					
50	--		--					
60	-1.69		8.49					
70	-1.40		6.93					
80	--		6.36					
100	-1.30		6.17					
150	-1.40*		6.04					
200	-0.86*		6.16					

STATION 28

<u>Date</u> 10/1		<u>Latitude</u> 85° 38.7' N	
<u>Depth</u>		<u>Longitude</u> 120° 40' W	
5	-1.70		9.02
10	-1.68		8.89
20	-1.68*		8.79
30	-1.68		8.89
40	-1.69*		8.72
50	-1.72*		8.67
60	-1.70		7.78
70	-1.38		7.23
80	-1.27*		6.65
100	-1.30		6.41
150	-1.44		6.26
200	--		6.19

STATION 29

<u>Date</u> 10/8		<u>Latitude</u> 85° 52.5' N	
<u>Depth</u>		<u>Longitude</u> 120° 21' W	
5	-1.70		8.75
10	-1.68		8.73
20	-1.68*		8.63
30	-1.69*		8.74
40	-1.68		8.62
50	--		8.39
60	-1.66		7.61
70	-1.40		6.87
80	-1.27*		6.63
100	-1.32*		6.47
150	-1.42*		6.23
200	--		6.57

STATION 30

Date 10/15
Depth

Latitude 86° 03' N
Longitude 119° 52' W

Depth m	T °C	S o/oo	O ₂ ml/l	Total P ug A/l	PO ₄ ug A/l	SiO ₄ ug A/l	NO ₃ ug A/l	NO ₂ ug A/l
5	-1.68*		8.83					
10	-1.68		8.72					
20	-1.69*		8.78					
30	-1.70		8.69					
40	-1.66		8.55					
50	-1.71*		8.65					
60	-1.67		--					
70	-1.50		7.84					
80	-1.27*		6.94					
100	--		6.82					
150	--		6.15					
200	--		6.79					

STATION 31

Date 10/24
Depth

Latitude 86° 23.3' N
Longitude 116° 37' W

5	-1.68*
10	-1.68
20	-1.67*
30	-1.68*
40	-1.69*
50	-1.70*
60	-1.66
70	-1.48
80	-1.27*
100	--
150	--
200	--

STATION 32

Date 10/30
Depth 1700

Latitude 86° 09.5' N
Longitude 114° 08' W

5	-1.69
10	-1.70
20	-1.70
40	-1.68
60	-1.66
80	-1.29
150	-1.32
200	-0.88
250	-0.27
300	0.14
400	0.37*
500	0.39*
600	0.22
700	0.14
800	0.07*
900	-0.01
1000	-0.12
1100	-0.29

4.2 T-3 (Bravo) Oceanography

Stations 1-8 (20 June 1957 - 15 May 1958)

The results from these stations originally appeared in Farlow⁷ (1958) as BRAVO Stations 12-17 (see Table 3) and are presented in the same form as ALPHA Stations 1-10, with the following exceptions:

Time - none given

Salinity - samples from Station 1 were titrated and the others run on the Mark I Salinometer at Woods Hole.

Stations 1-21 (26 May - 28 September 1958)

Time - of release of the first and last messengers of the station

Latitude and Longitude - station positions have been recomputed since reported by Collin² (1959). Values of longitude have been rounded to five minutes (5') of arc.

Depth - wire soundings of ocean depths listed in Collin² (1959) have been omitted because of large random discrepancies between these and the seismic soundings. The primary causes of the variances is thought to be a malfunctioning meter wheel. Ocean depth data for this period can be obtained in BATHYMETRY, pp. 68 to 70.

Salinity - Knudson titrations to an accuracy of $\pm 0.02\text{‰}$ were made by the Atlantic Oceanographic Group, Fisheries Research Board of Canada.

Stations 1-35 (9 June - 5 September 1960)

Time - given for the beginning and end of each station.

Depth - ocean depths obtained from seismic soundings (Stations 1-18) and wire soundings (Stations 19-35). Simultaneous wire and seismic soundings often had mutual discrepancies when water depths were greater than several hundred meters; the latter are considered more accurate.

Latitude and Longitude - for Stations 4, 6, 6a, 7, and 10, have been corrected on the basis of recomputation and error analysis of the drift station positions for the period June-September 1959.

Depth - sampling depths derived from meter wheel readings and paired, protected and unprotected, reversing thermometers. Sampling bottles with such pairs were alternated with those carrying two protected thermometers. As it was suspected that the pressure coefficients furnished by the manufacturer were incorrect, a station calibration was performed at depths of 500, 1000, 1500 and 2000 m. Data were interpolated to the standard depths.

Salinity/Chlorinity - determined by the Knudsen method, modified by the use of uranin as an indicator. The chlorinity of fresh and brackish water was

obtained by Mohr's method. Equivalent values of salinity were taken from Knudsen's tables.

NOTE: All chemical analyses (as well as the preparation of reagents) were conducted at the drift station oceanographic laboratory.

STATION 1

Start of Obs. Date Time Latitude Longitude
 5/20/57 ---- 82°51' N 96°10' W
 End of Obs.
Depth 1360 m.

Depth m	T °C	S o/oo	O ₂ ml/l	Total P ug at/l
6	-1.75	31.18		1.08
10	-1.83	31.44		1.13
25	-1.78	31.46		1.38
50	-1.57	31.77		1.40
75	-1.57	32.33		1.62
100*	-1.43	32.80		2.07
125	-1.37	33.30		1.86
150	-1.32	33.88		1.37
175*	-0.99	34.22		1.05
200	-0.64	34.36		----
250	-0.25	34.57		1.06
300*	0.10	34.66		1.04
345	0.30	34.73		0.98
395	0.32	34.78		0.99
444*	0.39	-----		0.93
490	0.40	34.85		1.11?
588	0.21	-----		0.96
784*	0.05	34.84		0.94
976	-0.08	34.84		1.01
1171	-0.28	34.88		0.99
1327*	-0.33	-----		0.99

STATION 2

	<u>Date</u>	<u>Time</u>	<u>Latitude</u>	<u>Longitude</u>
Start of Obs.	7/19/57	----	82°04' N	102°05' W
End of Obs.				
<u>Depth</u> 716 m.				

Depth m	T °C	S o/oo	O ₂ ml/l	Total P ug at/l
5	0.26	<1.00		----
10	-1.79	31.434		1.01
15	-1.71	31.437		1.04
30	-1.73	31.437		1.08
55	-1.78	31.469		0.97
80*	-1.43	32.268		1.66
103	-1.42	32.670		1.90
129	-1.47	33.080		----
153	-1.19	33.789		1.42
176	-0.99	34.159		1.09
200	-0.73	34.336		0.95
249*	-0.15	34.582		1.03
297	0.08	34.722		0.94
346	0.15	34.800		0.98
395*	0.34	34.830		0.98
446	0.31	34.851		1.01
495	0.23	34.865		1.03
593*	0.15	34.880		1.01
688*	-0.05	34.895		1.00

STATION 3

	<u>Date</u>	<u>Time</u>	<u>Latitude</u>	<u>Longitude</u>
Start of Obs.	8/12/57	----	82°12' N	101°05' W
End of Obs.				
Depth 591 m.				

Depth m	T °C	S o/oo	O ₂ ml/l	Total P ug at/l
5	-1.71			
15	-1.78			
30	-1.73			
55	-1.71			
80	-1.49			
105*	-1.45			
130	-1.38			
155	-1.27			
180	-1.34			
205	-0.49			
230	-0.34			
255	-0.18			
280	0.03			
305	0.04			
355*	0.26			
405	0.33			
455	0.28			
505*	0.22			
575*	0.08			

STATION 4

	<u>Date</u>	<u>Time</u>	<u>Latitude</u>	<u>Longitude</u>
Start of Obs.	9/20/57	----	82°03' N	104°15' W
End of Obs.				
<u>Depth 1750 m.</u>				

Depth m	T °C	S o/oo	O ₂ ml/l	Total P ug at/l
5	-1.71	31.000		1.00
10	-1.80	31.030		0.92
15*	-1.74	31.050		0.92
30	-1.71	31.121		0.97
55	-1.74	-----		1.00
80*	-1.44	32.363		1.64
105	-1.40	32.725		1.66
130	-1.47	33.090		1.82
155*	-1.33	33.707		1.62
180	-0.93	34.194		1.00
205	-0.63	34.397		0.84
230*	-0.35	34.485		0.86
255	-0.10	34.620		0.77
305	0.11	34.747		0.92
355*	0.28	34.808		0.83
405	0.38	34.859		0.91
455	0.36	34.837		0.93
505*	0.40	34.867		0.93
605	0.29	34.880		0.94
805	0.02	34.891		0.94
1005	-0.11	34.906		0.89

STATION 5

	<u>Date</u>	<u>Time</u>	<u>Latitude</u>	<u>Longitude</u>
Start of Obs.	9/20/57	----	82°03' N	104°15' W
End of Obs.				
<u>Depth 1750 m.</u>				

1205	-0.20	34.923	0.88
1405	-0.38	34.933	0.88
1605	-0.42	34.940	0.85
1705	-0.45	34.944	0.96

STATION 6

	<u>Date</u>	<u>Time</u>	<u>Latitude</u>	<u>Longitude</u>
Start of Obs.	11/8/57	----	81°01' N	109°05' W
End of Obs.	11/9/57	----	80°50' N	109°50' W
<u>Depth 970 m.</u>				

Depth m	T °C	S o/oo	O ₂ ml/l	Total P ug at/l
5	-1.72	31.109		0.96
10	-1.81	31.130		0.96
25*	-1.75	31.140		0.96
50	-1.72	31.273		0.97
75	-1.50	32.306		1.52
100*	-1.43	32.660		1.73
125	-1.41	33.077		1.24?
150	-1.35	33.779		1.38
175*	-0.95	34.208		0.95
200	-0.55	34.394		0.84
250	-0.17	34.626		0.99
300*	0.12	34.749		0.87
345	0.31	34.815		0.87
395	0.30	34.834		----
444	0.37	34.854		----
489	0.35	34.865		0.95
587	0.18	34.875		1.00
776	-0.02	34.895		1.07
873*	-0.07	34.906		----

STATION 7

Date Time Latitude Longitude
 Start of Obs. 4/9/58 ---- 80°17' N 112°50' W
 End of Obs.
Depth 880 m.

Depth m	T °C	S o/oo	O ₂ ml/l	Total P ug at/l
5	-1.76	31.586		1.16
10	-1.87	31.371		1.17
26*	-1.80	31.487		0.94
47	-1.76	31.497		1.00
70	-1.55	32.316		1.70
94*	-1.51	32.648		1.82
123	-1.43	33.060		2.18
147	-1.37	33.700		1.55
172*	-1.01	34.167		1.07
199	-0.62	34.357		0.98
248	-0.28	-----		0.82
298*	0.07	34.414		0.81
344	0.27	34.806		0.77
393	0.24?	34.835		0.88
442*	0.35	34.852		0.81
491	0.36	34.860		0.92
590	0.15	34.883		0.87
786	-0.04	34.899		0.81

STATION 8

Start of Obs. Date Time Latitude Longitude
 5/15/58 80°02' N 115°50' W
 End of Obs.
 Depth 1380 m.

Depth m	T °C	S o/oo	O ₂ ml/l	Total P ug at/l
5	-1.70	31.512		0.85
10	-1.86	31.510		0.90
24*	-1.79	31.511		0.95
50	-1.76	31.523		1.03
74	-1.56	32.356		1.75
99*	-1.44	32.671		1.64
120	-1.42	33.045		1.89
144	-1.45	33.590		1.74
168*	-1.12	34.085		1.17
195	-0.69	34.331		0.78
243	-0.29	34.574		0.87
292*	0.05	34.727		0.90
339	0.26	34.801		0.83
388	0.26?	34.835		0.92
436*	0.37	34.853		0.89
486	0.38	34.866		1.06
583	0.20	34.881		
777*	0.07	34.898		
1000	-0.17	34.910		
1166	-----	34.921		
1263*	-0.31	34.932		

STATION 1

Date: 5/26/58Time: 1700-2015Latitude: 79°58' NLongitude: 116°30' WWeather: 02Wind: Dir. 360° Speed 10 kts Vis.: 10 miTemp.: Dry -6.2°C Wet -6.7°CHum.: 85%Bar.: 1013.9 mbCloud: Sc Amt. 10

Depth m	Temp. °C	Sal. o/oo	O ₂ ml/l	PO ₄ µg at/l
0		31.02		
5		31.55		
10		31.55		
20		31.55		
30				
50		31.58		
75		32.39		
100		32.72		
150		33.58		
200		34.38		
250		34.60		
290		34.69		
381		34.87		
473		34.90		
565		34.90		
659		34.92		
756		34.92		
949		34.94		
1142		34.99		

STATION 2

Date: 5/29-30/58Time: 1400-1645Latitude: 79°55' NLongitude: 115°35' WWeather: 02Wind: Dir. 225° Speed 10 kts Vis.: 7 miTemp.: Dry -5.7°C Wet -6.5°CHum.: 92%Bar.: 1019.0 mbCloud: St Amt. 10

	0	-1.6	31.08
1645 hrs.	5	-1.71	31.49
5/30/58	10	-1.69	31.54
	20	-1.68	31.54
	30	-1.70	31.54
	50	-1.68	31.55
	75	-1.43	32.36
	100	-1.40	32.63
	149	-1.38	33.60
	*197	-0.59	34.34
	249	-0.18	34.51
	298	0.16	34.65
	*396	0.37	34.76
	498	0.42	34.85
	595	0.34	34.87
	*681	0.20	34.87
1643 hrs.	782	0.12	34.88
5/29/58	*962	-0.08	34.92

STATION 3

Date: 6/3/58

Time: 1605-1930

Latitude: 79°53' N

Longitude: 115°20' W

Weather: 70

Wind: Dir. 315° Speed 4 kts Vis.: 15 mi

Temp.: Dry -3.6°C Wet -4.7°C

Hum.: 74% Bar.: 1022.7 mb

Cloud: Sc Amt. 9

Depth m	Temp. °C	Sal. o/oo	O ₂ ml/l	PO ₄ µg at/l
0	-1.6	31.53	7.92	1.15
5	-1.67	31.53	7.94	1.64
10	-1.73	31.52	7.80	1.13
20	-1.70	31.53	7.78	1.13
30	-1.67	31.51	7.81	1.29
50	-1.70	31.53	7.80	1.41
75	-1.43	32.31	7.23	1.22
98	-1.36	32.67	----	1.15
*147	-1.35	33.62	5.54	2.69
*195	-0.60	34.33	5.90	3.08
*292	0.16	34.76	5.73	2.62
*385	0.40	34.81	5.76	1.54
*483	0.41	34.87	6.02	2.20?
*581	0.31	34.85	5.94	1.70
*677	0.20	34.88	6.04	2.28?
*774	0.10	34.88	6.08	1.60
*968	-0.05	34.90	6.26	1.80

STATION 4

Date: 6/10/58

Time: 1605-1935

Latitude: 79°44' N

Longitude: 116°20'

Weather: 01

Wind: Dir. 360° Speed 4 kts Vis.: 15 mi

Temp.: Dry 1.3°C Wet 0.3°C

Hum.: 83% Bar.: 1029.5 mb

Cloud: Ci Amt. 3

0	-1.4	29.88	7.89	----
5	-1.70	31.53	7.94	1.65
10	-1.71	31.53	7.94	1.57
20	-1.74	31.53	7.98	1.34
30	-1.71	31.53	8.00	1.65
50	-1.70	31.59	7.92	1.65
75	-1.43	32.38	6.44	2.09
100	-1.38	32.65	6.14	1.96
144	-1.30	33.60	5.64	2.00
195	-0.64	34.33	5.96	1.04
* 294	0.14	34.72	5.76	1.01
* 393	0.38	34.79	5.82	1.13
* 481	0.43	34.85	5.92	0.96
* 580	0.33	34.87	6.01	0.98
* 680	0.21	34.87	6.06	0.99
* 770	0.12	34.94	6.09	0.94
* 964	-0.03	34.94	6.26	1.06
*1164	-0.18	34.94	6.19	1.17

STATION 5

Date: 6/17/58

Time: 1510-1850

Latitude: 79°46' N

Longitude: 116°20' W

Weather: 00

Wind: Dir. 225° Speed 3 kts Vis.: 15 mi

Temp.: Dry 2.2°C Wet 1.1°C

Hum.: 82%

Bar.: 1022.0 mb

Cloud: -- Amt. 00

Depth m	Temp. °C	Sal. o/oo	O ₂ ml/l	PO ₄ µg at/l
0	-1.2	30.00	8.55	----
5	-1.63	31.47	8.47	2.18
10	-1.67	31.47	8.39	0.87
20	-1.70	31.49	8.44	1.22
30	-1.67	31.50	8.32	1.04
50	-1.68	31.49	8.74	1.31
75	-1.45	32.35	7.07	1.74
100	-1.37	32.61	6.78	1.31
105	-----	32.65	6.66	2.26
150	-1.29	33.55	6.14	2.44
205	-0.61	34.34	6.52	1.22
305		34.70	5.62	1.48
* 484	0.41	34.85	6.14	1.48
* 581	0.33	34.88	6.25	1.22
* 679	0.21	34.88	6.25	1.39
* 775	0.10	34.88	6.24	1.22
* 964	-0.04	34.88	6.03	1.22
*1184	-0.19	34.88	5.40	

STATION 6

Date: 6/24/58

Time: 1645-1937

Latitude: 79°45' N

Longitude: 116°10'

Weather: 02

Wind: Dir. 270° Speed 9 kts Vis.: 7 mi

Temp.: Dry 1.1°C Wet 0.5°C

Hum.: 90%

Bar.: 1021.7 mb

Cloud: St Amt. 10

0	0.0	<1.00	9.44	1.22
5	-1.69	<1.00	8.75	1.74
10	-1.65	<1.00	8.66	1.65
20	-1.71	31.46	8.70	1.57
30	-1.70	31.48	8.59	1.61
50	-1.68	31.49	8.61	2.52
75	-1.39	32.27	6.87	3.39
97	-1.41	32.62	6.55	3.15
148	-1.29	33.40	6.08	3.24
* 198	-0.61	34.36	6.39	2.26
* 239	-0.16	34.56	6.38	1.41
* 284	0.17	34.70	6.09	1.65
* 377	0.39	34.85	6.29	1.65
* 475	0.42	34.81	6.37	1.74
* 563	0.33	34.79	6.60	1.74
* 761	0.12		6.49	1.81
* 961	-0.02		6.59	1.31
*1061	-0.11	34.83	6.14	1.74

STATION 7

Date: 7/1/58

Time: 1555-1840

Latitude: 79°43' N Longitude: 116°50' W
Weather: 11 Wind: Dir. 090° Speed 12 kts Vis.: 6 mi
Temp.: Dry 1.1°C Wet 0.6°C Hum.: 90% Bar.: 1019.3 mb
Cloud: St Amt. 10

Depth m	Temp. °C	Sal. o/oo	O ₂ ml/l	PO ₄ µg at/l
0	0.0	<1.00	9.72	0.17
5	-0.73	14.81	9.32	0.52
10	-1.49	31.48	8.69	2.35
20	-1.74	31.43	8.74	0.96
30	-1.70	31.46	8.65	1.74
50	-1.59	31.89	7.47	1.82
75	-1.40	32.35	6.96	2.26
98	-1.40	33.65	6.26	2.43
139	-1.30	33.58	6.19	2.26
* 189	-0.59	34.31	6.54	1.04
* 242	-0.18	34.56	6.44	1.22
* 291	0.15	34.75	6.23	1.74
* 390	0.38	34.82	6.32	1.92
* 490	0.39	34.83	6.54	1.30
* 593	0.51	34.87	6.57	1.57
* 775	0.10	34.87	6.71	1.74
* 962	-0.05	34.88	6.69	1.22
*1161	-0.19	34.94		1.39

STATION 8

Date: 7/8/58

Time: 1507-2025

Latitude: 79°28' N Longitude: 118°05' W
Weather: 50 Wind: Dir. 310° Speed 20 kts Vis.: 2 mi
Temp.: Dry 0.2°C Wet -0.2°C Hum.: 94% Bar.: 1018.0 mb
Cloud: St Amt. 10

0	0.3	<1.00	10.00	0
5	0.16	<1.00	9.94	0
10	-1.70	31.38	8.85	1.04
20	-1.66	31.46	8.74	0.87
30	-1.71	31.47	8.22	1.67
50	-1.65	31.48	8.85	1.23
70	-1.41	32.23	7.06	2.02
93	-1.37	32.56	6.69	1.67
149	-1.38	33.41	6.17	2.11
* 195	-0.70	34.22	6.49	0.87
* 238	-0.25	34.49	6.44	1.23
* 283	0.09	34.70	6.20	0.97
* 385	0.38	34.76	6.35	1.67
* 474	0.43	34.83	6.54	0.97
* 579	0.35	34.83	6.54	0.79
* 767	0.15	34.87	6.70	0.79
* 955	-0.01	34.88	6.80	0.87
*1449	-0.32	34.94	5.86	1.04

STATION 9

Date: 7/15/58

Time: 1404-1623

Latitude: 79°14' N

Longitude: 118°50' N

Weather: 70

Wind: Dir.: 225° Speed 8 kts Vis.: 2 mi

Temp.: Dry 0.6°C Wet 0.3°C

Hum.: 95%

Bar.: 994.9 mb

Cloud: St Amt. 10

Depth m	Temp. °C	Sal. o/oo	O ₂ ml/l	PO ₄ µg at/l
0	0.0	<1.00		0
5	0.07	<1.00		0.08
10	-1.71	31.44	8.85	2.02
20	-1.68	31.47	8.86	2.18
30	-1.70	31.46	8.90	2.27
50	-1.69	31.49	8.79	1.78
75	-1.41	32.39	6.95	2.76
105	-1.40	32.80	6.60	2.84
160	-1.29	33.73	6.14	2.92
* 201	-0.49	34.37	6.55	1.54
328	0.27	34.77	6.44	1.94
* 424	0.44	34.78	6.49	1.86
* 519	0.37	34.78	6.71	1.86
* 612	0.34	34.83	6.79	2.51?
841	0.03	34.83	6.89	1.62
*1028	-0.08	34.83	6.72	1.62
*1524	-0.37	34.87	6.54	
*1770	-0.37	34.90	6.49	

STATION 10

Date: 7/22/58

Time: 1414-1708

Latitude: 79°15' N

Longitude: 118°40' W

Weather: 02

Wind: Dir. 180° Speed 2 kts Vis.: 15 mi

Temp.: Dry 2.1°C Wet 1.6°C

Hum.: 91%

Bar.: 1021.7 mb

Cloud: Ac Amt. 8

0	0.3	<1.00	10.00	1.13
5	0.22	<1.00		0.0
10	-1.65	31.31	9.13	1.22
20	-1.68	31.41	8.87	1.30
30	-1.63	31.41	8.83	1.70
50	-1.71	31.45	8.82	2.03
75	-1.40	32.29	7.04	2.35
99	-1.40	32.81	6.50	2.76
149	-1.23	33.82	5.91	2.76
* 199	-0.52	34.33	6.58?	1.54
* 249	-0.05	34.56	6.47	1.05
320	0.25	34.67	6.27	2.03
* 417	0.42	34.78	6.41	1.54
* 513	0.37	34.81	6.57	1.46
* 605	0.32	34.82	6.64	1.62
815	0.08	34.87	6.76	1.62
*1001	-0.07	34.92	6.73	1.54
*1498	-0.34	34.92	6.63	
*1776	-0.36	34.92	6.71	

STATION 11

Date: 7/29/58

Time: 1426-1800

Latitude: 79°07' N

Longitude: 119°25' W

Weather: 02

Wind: Dir.: 040° Speed 10 kts Vis.: 15 mi

Temp.: Dry 1.6°C Wet 0.9°C

Hum.: 89%

Bar.: 1018.6 mb

Cloud: Cl Amt. 1

Depth m	Temp. °C	Sal. o/oo	O ₂ ml/l	PO ₄ µg at/l
0	0.0	<1.00	9.70	1.54
5	0.27	<1.00	9.65	0.00
10	-1.59	31.31	9.06	0.89
20	-1.63	31.37	9.09	0.97
30	-1.68	31.45	8.99	0.89
50	-1.67	31.52	8.77	1.29
75	-1.40	32.33	7.12	1.86
100	-1.38	32.59	6.74	2.26
140	-1.33	33.52	6.24	2.18
* 189	-0.73	34.26	6.59	0.89
* 238	-0.13	34.65		0.97
329	0.26	34.79	6.36	1.46
* 420	0.40	34.90	6.57	0.97
* 514	0.38	34.88	6.62	0.89
* 606	0.33	34.90	6.65	1.05
808	0.10	34.90	6.77	0.81
*1000	-0.04	34.91	6.71	0.89
*1500	-0.33	34.96	6.77	1.38
*1970	-0.37	34.92	6.24	1.13

STATION 12

Date: 8/5/58

Time: 1645-2042

Latitude: 79°01' N

Longitude: 121°15' W

Weather: 02

Wind: Dir.: 135° Speed 4 kts Vis.: 15 mi

Temp.: Dry 3.1°C Wet 3.3°C

Hum.: 96%

Bar.: 1021.0 mb

Cloud: -- Amt. 0

0	0.6	<1.00	9.88	0
5	0.38	<1.00	9.70	0
10	-1.64	31.40	9.13	1.05
20	-1.67	31.45	9.16	1.13
30	-1.66	31.44	9.08	1.62
50	-1.69	31.46	9.00	1.78
69	-1.37	32.33	7.21	2.26
100	-1.38	32.65	6.92	3.08
117	-1.37	32.77	----	2.59
150	-1.25	33.39	6.04	2.26
* 290	-0.54	34.87	6.39	1.46
* 416	0.40	34.88	6.57	1.70
* 517	0.38	34.88	6.66	1.46
* 605	0.35	34.89	6.82	1.46
758	0.07	34.90	6.89	1.29
*1011	-0.07	34.93	6.86	1.54
*1510	-0.35	34.94	6.81	1.21
*1990	-0.38	34.94	6.76	1.13

STATION 13

Date: 8/12/58Time: 1414-1815Latitude: 78°48' NLongitude: 141°55' WWeather: 44 02Wind: Dir. 210° Speed 3 ktsVis.: 1/4 miTemp.: Dry 0.4°C Wet 0.3°CHum.: 96%Bar.: 1014.6 mbCloud: St Amt. 10

Depth m	Temp. °C	Sal. o/oo	O ₂ ml/l	PO ₄ µg at/l
0	0.0	<1.00	9.86	0
5	0.47	<1.00	9.75	0.17
10	-1.70	31.35	9.14	1.13
20	-1.66	31.35	9.13	1.31
30	-1.69	31.40	9.18	1.24
50	-1.67	31.45	9.01	1.24
75	-1.41	32.16	7.04	1.91
100	-1.38	32.56	6.66	2.61
158	-1.33	33.57	6.09	2.18
203	-0.56	34.32	6.44	0.96
* 250	-0.15	34.53		
* 297	0.20	34.62	6.15	1.24
430	0.44	34.80	6.49	1.04
* 525	0.40	34.80	6.54	1.13
* 620	0.28	34.81	6.76	1.04
* 805	0.14	34.83	6.64	1.13
1016	-0.08	34.89	6.69	1.24
*1210	-0.21	34.89		1.04
*1510	-0.37	34.89	6.67	1.24
*1980	-0.36	34.91	6.65	1.13

STATION 14

Date: 8/19/58Time: 1443-1841Latitude: 78°46' NLongitude: 122°35' WWeather: 02Wind: Dir. 320° Speed 6 ktsVis.: 1/4 miTemp.: Dry 0.2°C Wet 0.0°CHum.: 95%Bar.: 1019.0 mbCloud: Fs Amt. 10

Depth m	Temp. °C	Sal. o/oo	O ₂ ml/l	PO ₄ µg at/l
0	0.0	<1.00	9.79	0.17
5	0.22	<1.00	9.71	0.0
10	-1.66	31.29	9.17	1.31
20	-1.62	31.33	9.20	1.57
30	-1.63	31.34	9.22	1.48
50	-1.64	31.48	8.95	1.83
78	-1.40	32.27	7.21	2.96
94	-1.36	32.59	6.91	2.96
160	-1.32	33.61	6.28	2.87
* 215	-0.61	34.35	6.66	1.39
* 256	-0.16	34.62		
* 295	0.21	34.77	6.44	1.57
433	0.42	34.82	6.59	1.74
* 525	0.41	34.87	6.71	1.57
* 616	0.29	34.87	6.83	1.66
* 806	0.15	34.89	6.89	1.74
1025	-0.09	34.93	6.94	1.74
*1218	-0.21	34.94		1.66
*1510	-0.38	34.87	6.81	1.66
*1990	-0.36	34.69?	6.71	1.57

STATION 15

Date: 8/22/58

Time: 1515-1720

Latitude: 78°43' N

Longitude: 123°25' W

Weather: 00

Wind: Dir.: 360° Speed 2 kts Vis.: 15 mi

Temp.: Dry 1.6°C Wet 0.7°C

Hum.: 86%

Bar.: 1022.4 mb

Cloud: Ac Amt. 9

Depth	Temp.	Sal.	O ₂	PO ₄
m	°C	o/oo	ml/l	µg at/l
0	0.0	<1.00	9.96	0
5	0.20	<1.00	10.01	0
10	-1.61	31.28	9.31	0.96
20	-1.59	31.30	9.29	0.96
30	-1.67	31.38	9.28	0.87
50	-1.63	31.57	9.06	0.96
75	-1.39	32.26	7.28	1.65
100	-1.36	32.60	6.94	1.83
125	-1.42	32.96	6.51	1.91
150	-1.37	33.39	6.36	1.91
177	-1.15	34.04	6.35	1.39
*199	-0.69	34.32	6.74	1.13
*223	-0.45	34.48	6.65	0.87
*238	-0.15	34.60	6.66	0.96

STATION 16

Date: 8/26/58

Time: 1436-1910

Latitude: 78°44' N

Longitude: 123°40' W

Weather: 44

Wind: Dir. 045° Speed 11 kts Vis.: 1/2 mi

Temp.: Dry 1.0°C Wet 0.6°C

Hum.: 93%

Bar.: 1016.9 mb

Cloud: Fs Amt. 10

0	0.6	<1.00	10.00	0
5	0.22	<1.00	9.96	0
10	-1.61	31.26	9.25	1.21
20	-1.62	31.29	9.35	1.40
30	-1.63	31.37	9.39	1.30
50	-1.65	-----	-----	1.49
75	-1.39	32.21	7.39	2.23
91	-1.35	32.56	7.04	2.61
157	-1.35	33.52	6.41	2.42
* 204	-0.68	34.32	6.75	1.30
* 249	-0.17	34.57		
* 292	0.18	34.75	6.44	1.58
437	0.42	34.87	6.72	1.30
* 534	0.41	34.89	6.79	1.30
* 621	0.30	34.90	6.84	1.30
* 804	0.15	34.93	7.00	1.40
1015	-0.09	34.94	7.06	1.40
*1211	-0.19	34.96		1.68
*1505	-0.36	-----	6.95	1.30
*1980	-0.38	34.96	6.96	1.40

STATION 17

Date: 9/2/58

Time: 1430-1630

Latitude: 78°44' N

Longitude: 123°50' W

Weather: 02

Wind: Dir. 175° Speed 12 kts Vis.: 15 mi

Temp.: Dry 1.1°C Wet 0.6°C

Hum.: 90%

Bar.: 1005.1 mb

Cloud: Sc Amt. 10

Depth m	Temp. °C	Sal. o/oo	O ₂ ml/l	PO ₄ µg at/l
0	0.3	<1.00	10.02	0.03
5	0.11	<1.00	10.01	0.0
10	-1.69	31.41	9.43	0.0
20	-1.65	31.41	9.47	0.66
30	-1.65	31.47	9.46	0.68
50	-1.65	31.52	9.39	0.69
75	-1.37	32.20	11.71	1.07
100	-1.37	32.57	7.12	1.26
150	-1.36	33.41	6.47	1.26
200	-0.65	34.33	6.89	
* 249	-0.24	34.59		0.63
* 297	0.18	34.78	6.55	0.69
426	0.42	34.84	6.80	0.66
* 523	0.41	34.84	6.77	0.66
* 616	0.32	34.86	6.89	0.63
* 806	0.15	34.86	7.05	0.69
1014	-0.08	34.87	7.11	0.63
*1212	-0.18	34.87		0.63
*1510	-0.36	34.91	7.00	0.66
*1960	-0.37	34.94	7.06	0.77

STATION 18

Date: 9/9/58

Time: 1424-1751

Latitude: 78°33' N

Longitude: 122°55' W

Weather: 03

Wind: Dir. 220° Speed 7 kts Vis.: 15 mi

Temp.: Dry -7.1°C Wet -7.1°C

Hum.: 98%

Bar.: 1013.2 mb

Cloud: Ac Amt. 9

0	0.3	<1.00	0.0
5	-1.61	19.34	0.27
10	-1.70	31.18	0.49
20	-1.64	31.25	0.48
30	-1.64	31.24	0.48
50	-1.63	31.46	0.53
75	-1.39	32.23	0.91
100	-1.36	32.64	1.02
150	-1.37	33.59	1.07
200	-0.68		0.48
* 252	-0.19	34.62	0.51
* 302	0.26	34.75	0.55
388	0.38	34.80	
* 493	0.42	34.78	0.49
* 603	0.32	34.87	0.48
* 804	0.16	34.91	0.53
999	-0.06	34.91	0.51
*1200	-0.19	34.96	0.51
*1498	-0.36	34.94	0.53
*1777	-0.36	34.96	0.58

STATION 19

Date: 9/16/58Time: 1506-1800Latitude: 78°27' NLongitude: 122°20' WWeather: 42Wind: Dir. 270° Speed 10 kts Vis.: 3 miTemp.: Dry -5.6°C Wet -5.7°CHum.: 93%Bar.: 993.2 mbCloud: St Amt. 10

Depth m	Temp. °C	Sal. o/oo	O ₂ ml/l	PO ₄ µg at/l
0	0.0	<1.00		----
5	0.02	<1.00		0.0
10	-1.50	31.18		0.51
20	-1.70	31.22		0.53
30	-1.64	31.22		0.54
50	-1.67	31.32		0.54
75	-1.34	32.22		0.90
104	-1.43	32.56		1.01
146	-1.26	33.54		0.95
202	-0.63	34.30		0.49
* 252	-0.17	34.59		0.48
* 311	0.18			0.54
* 378	0.43	34.91		0.56
498	0.43	34.92		0.56
* 606	0.26			0.56
* 800	0.06			0.60
* 900	-0.01	34.93		0.58

STATION 20

Date: 9/23/58Time: 1435-1654Latitude: 78°26' NLongitude: 122°10' WWeather: 2Wind: Dir. 100° Speed 6 kts Vis.: 10 miTemp.: Dry -6.1°C Wet -6.3°CHum.: 92%Bar.: 1011.2 mbCloud: St Amt. 10

Depth m	Temp. °C	Sal. o/oo	PO ₄ µg at/l
0	0.0	<1.00	0.12
5	0.03	<1.00	0.0
10	-1.66	31.19	0.68
20	-1.72	31.24	0.70
30	-1.66	31.24	0.70
50	-1.67	31.32	0.71
75	-1.37	32.25	1.12
99	-1.43		1.22
148	-1.31	33.48	1.27
203	-0.64	34.32	0.61
* 253	-0.14	34.60	0.65
* 306	0.19	34.78	0.66
* 383	0.44	34.84	0.68
495	0.41	34.92	0.63
* 602	0.38	34.93	0.63
* 805	0.05	34.93	0.65
*1002	-0.05	34.93	0.63

STATION 21

Date: 9/27-28/58

Time: 1725-1554

Latitude: 78°28' N?Longitude: 122°30' W?Weather: 02Wind:

Dir. 270° Speed 10 kts

Vis.: 10 miTemp.: Dry 0.1°C Wet -0.1°CHum.:

96%

Bar.: 1010.8 mbCloud: Sc Amt. 1

	Depth m	Temp. °C	Sal. o/oo	O ₂ ml/l	PO ₄ µg at/l
	0	-0.3	<1.00		0.24
1729	5	-1.64	24.40		0.53
9/28/58	10	-1.69	31.14		0.66
	20	-1.71	31.13		0.77
	30	-1.66	31.22		0.75
	50	-1.65	31.55		0.73
	75	-1.36	32.25		1.12
	96	-1.44	32.59		1.26
	137	-1.26	33.54		1.38
1554	196	-0.07	34.33		0.81
9/28/58	*243	-0.20	34.58		0.61
	*290	0.09	34.69		0.73
	*380	0.38	34.81		0.73
1725	*517	0.30	34.87		0.68
9/27/58	*635	0.17	34.88		0.68

STATION 1

Date: 6/9/59 Time: 2200-2240
Latitude: 72°20' N Longitude: 130°35' W Depth: 980 m
Weather: 02 Wind: 270° Speed 7 kts Cloud: Sc, 6
Temp.: Dry -2.3°C Wet -2.9°C

Depth m	Temp °C	Chlor. o/oo	Sal. o/oo	Sigma-T
0	0.60	4.50	8.15	6.50
15	-1.68	17.43	31.49	25.25

STATION 2

Date: 6/10/59 Time: 2300-(0400? 11th)
Latitude: 72°17' N Longitude: 130°30' W Depth: 890 m (?)
Weather: 02 Wind: 222° Speed 15 kts Cloud: Ci, 3
Temp: Dry -0.8°C Wet [-1.1°C]

588	0.24	19.31	34.89	28.02
686	0.13	19.31	34.89	28.02
784	0.00	19.34	34.95	28.08
882	-0.10	19.34	34.95	28.08

STATION 3

Date: 6/11/59 Time: 2220-0120(12th)
Latitude: 72°15' N Longitude: 130°25' W Depth: 680 m
Weather: 44 Wind: 250° Speed 15 kts Cloud: St, 10
Temp.: Dry 2.0°C Wet 0.7°C

0	0.13	1.46	2.67	2.07
10	-1.66	17.41	31.46	25.32
20	-1.66	17.43	31.49	25.35
30	-1.67	17.42	31.47	25.33
50	-1.70	17.46	31.55	25.39
75	-1.50	17.70	31.98	25.74
100	-1.41	18.01	32.54	26.19
125	-1.36	18.32	33.10	26.65
300	0.26	19.26	34.79	27.94
400	0.40	19.29	34.85	27.99
500	0.34	19.32	34.90	28.03
600	0.26	19.32	34.90	28.03
660	0.18	19.33	34.92	28.05

STATION 5aDate: 7/9/59Time: 2029-2055Latitude: 71°57.3' NLongitude: 132°30' WDepth: 1457 mWeather: 03Wind: 195° Speed 2 ktsCloud: Cl, Cs, 5Temp.: Dry 1.7°C Wet 1.4°C

Depth m	Temp. °C	Chlor o/oo	Sal. o/oo	Sigma-T	Oxygen ml / l	Si µg-at/l
0	0.10					
3	0.11					
6	-1.66					
9	-1.62					
12	-1.61	17.11	30.91	24.79		
14.5	-1.62	17.11	30.91	24.79		

STATION 6Date: 7/13/59Time: 1932-2259Latitude: 71°44' NLongitude: 132°32'Depth: 1400 m (est.)Weather: 44Wind: 294° Speed 10 ktsCloud: F, 5; Sc, 5Temp.: Dry 0.3°C Wet 0.1°C

0	0.24	0.08	0.17	0.05	9.57	93.7	1.4
5	0.12	0.51	0.95	0.70			6.3
10	-1.70	17.26	31.18	25.10	9.16	105.7	5.8
20	-1.65	17.32	31.29	25.19			8.9
30	-1.66	17.35	31.35	25.23	9.00	104.7	7.7
50	-1.68	17.38	31.40	25.27	9.06	104.7	7.1
75	-1.38	17.87	32.29	25.99			13.8
100	-1.42	18.11	32.72	26.34	6.63	78.1	19.7
125	-1.56	18.36	33.17	26.70			20.8
150	-1.50	18.45	33.33	26.84	6.58	78.8	20.0
175	-1.47	18.51	33.44	26.92			22.2
200	-1.35	18.57	33.55	27.01	6.54	77.4	21.3
250	-0.43	19.07	34.45	27.70			10.7
300	0.07	19.21	34.70	27.88	5.85	72.7	12.6
350	0.25	19.26	34.79	27.94			9.9
400	0.36	19.27	34.81	27.95	6.30	79.0	9.0
450	0.43	19.29	34.85	27.98			8.8
500	0.40	19.32	34.90	28.03	6.28	78.9	9.5
600	0.31	19.35	34.96	28.07	6.56	82.2	9.0
700	0.21	19.36	34.97	28.09			7.0
800	0.09	19.34	34.94	28.07	6.60	82.2	7.8
1000	-0.10	19.33	34.92	28.07	6.72	81.6	7.7
1200	-0.25	19.33	34.92	28.07			8.2
1372	-0.34	19.33	34.92	28.08	6.82	84.1	8.2

STATION 8

Date: 8/5/59

Time: 1910-2437

Latitude: 71°23' N

Longitude: 134°21' W

Depth: 1027 m

Weather: 02

Wind: 246° Speed 6 kts

Cloud: St, 10

Temp.: Dry 0.3°C Wet -0.2°C

Depth m	Temp. °C	Chlor. o/oo	Sal. o/oo	Sigma-T	Oxygen ml/l	%	Si µg-at/l
0	-0.10	0.11	0.23	0.07	9.85	95.5	1.7
5	-0.49	3.36	6.10	4.77			2.1
10	-1.35	16.26	29.38	23.79	9.10	104.5	6.3
25	-1.36	16.61	30.01	24.15	9.10	105.1	6.3
50	-1.49	17.49	31.60	25.45	8.67	101.6	8.2
75	-1.49	17.82	32.20	25.92			13.2
100	-1.48	18.06	32.63	26.27	6.87	80.5	17.8
125	-1.54	18.32	33.10	26.66			20.3
150	-1.47	18.51	33.44	26.92	6.50	76.9	20.8
175	-1.10	18.79	33.95	27.32			15.8
200	-0.40	19.09	34.49	27.74	6.05	73.6	11.7
250	0.08	19.23	34.74	27.92	5.85	72.5	11.2
300	0.28	19.28	34.83	27.97	6.05	75.8	10.7
350	0.37	19.29	34.85	27.99			9.9
400	0.40	19.30	34.87	28.00	6.41	80.4	8.9
450	0.41	19.31	34.89	28.01			8.3
500	0.38	19.31	34.89	28.01	6.49	81.3	8.2
550	0.34	19.32	34.90	28.03			8.2
600	0.29	19.32	34.90	28.03	6.65	83.3	8.2
700	0.17	19.33	34.92	28.05			8.1
800	0.04	19.34	34.94	28.08	6.75	84.1	7.7
900	-0.10	19.34	34.94	28.09			7.7
1000	-0.27	19.35	34.96	28.10	6.64	82.0	7.3

STATION 9

Date: 8/24/59

Time: 1920-0115(25th)

Latitude: 71°26' N

Longitude: 135°30' W

Depth: 1362 m

Weather: 45

Wind: 120° Speed 4 kts

Cloud: F, 10

Temp.: Dry 0.3°C Wet 0.2°C

0	0.11	0.86	1.58	1.20	9.90	97.5	2.3
10	-1.01	15.83	28.60	22.95	8.93	102.6	4.3
25	-1.46	17.22	31.11	25.04	9.34	96.9	5.8
50	-1.60	17.39	31.42	25.29	9.05	105.2	5.8
75	-1.41	17.82	32.20	25.92			14.0
100	-1.47	18.09	32.68	26.31	6.73	79.2	17.8
125	-1.50	18.28	33.03	26.59			22.3
150	-1.43	18.47	33.37	26.86	6.36	75.3	19.0
175	-1.18	18.68	33.75	27.17			19.5
200	-0.82	18.92	34.18	27.50	6.05	73.2	13.9
250	-0.14	19.15	34.60	27.81			13.4
300	0.15	19.23	34.74	27.91	6.09	75.9	10.7
350	0.33	19.28	34.83	27.97			11.8
400	0.42	19.29	34.85	27.99	6.27	78.7	10.1
450	0.44	19.30	34.87	28.00			9.1
500	0.40	19.30	34.87	28.00	6.43	80.7	8.0
550	0.37	19.31	34.89	28.01			
600	0.32	19.31	34.89	28.02			7.1
700	0.22	19.32	34.90	28.04			7.7
800	0.11	19.32	34.90	28.04	6.66	82.9	8.7
900	0.01	19.32	34.90	28.05	6.70	83.2	7.7
1000	-0.10	19.33	34.92	28.07	6.82	84.5	8.2
1200	-0.27	19.34	34.94	28.09	6.62	82.2	8.3

STATION 12

Date: 12/4/59

Time: 1920-2232

Latitude: 71°11' N

Longitude: 146°17' W

Depth: 2157 m

Weather: 02

Wind: 245° Speed 10 kts

Cloud: 0

Temp.: Dry -29.5°C Wet -29.7°C

Depth m	Temp. °C	Chlor. o/oo	Sal. o/oo	Sigma-T	Oxygen ml / l	%	Si µg-at/l
1	-1.51	15.48	27.97	22.50	9.66	109.3	8.7
10	-1.51	15.48	27.97	22.50	9.61	108.7	10.6
20	-1.43	16.87	30.48	24.53			10.7
30	-1.49	17.42	31.47	25.33	9.23	107.5	11.0
50	-1.31	17.76	32.09	25.83	8.08	95.0	18.3
75	-1.36	17.99	32.50	26.16			19.3
100	-1.42	18.16	32.81	26.41	7.06	83.2	22.7
125	-1.48	18.31	33.08	26.63			29.1
150	-1.38	18.58	33.57	27.02	6.76	80.2	24.5
200	-0.43	19.07	34.45	27.70	6.46	79.1	15.5
250	0.07	19.23	34.74	27.92			14.3
300	0.27	19.28	34.83	27.97	6.65	82.2	11.4
350	0.41	19.30	34.87	28.00	6.85	85.9	10.1
400	0.45	19.31	34.89	28.00			8.1
450	0.42	19.31	34.89	28.00	6.79	85.2	9.4
500	0.40	19.32	34.90	28.03			
550	0.37	19.32	34.90	28.03			9.2
600	0.31	19.32	34.90	28.03			
650	0.24	19.32	34.90	28.04	6.89	86.2	9.6
700	0.16	19.32	34.90	28.04			
800	0.02	19.33	34.92	28.06			
850	-0.04	19.33	34.92	28.06	6.93	86.0	8.0
1000	-0.16	19.34	34.94	28.09			
1068	-0.21	19.34	34.94	28.09	6.94	85.9	8.0

STATION 13

Date: 12/21/59

Time: 1945-2258

Latitude: 71°05' N

Longitude: 145°05' W

Depth: 1426 m

Weather: 02

Wind: 60° Speed 11 kts

Cloud: St, 2; As 8

Temp.: Dry -26.6°C Wet -26.8°C

1	-1.56	15.34	27.72	22.29	9.60	108.2	7.8
10	-1.54	15.39	27.81	22.37	9.61	108.5	7.5
20	-1.51	15.70	28.37	22.82			9.8
30	-1.53	17.34	31.33	25.21	9.48	110.0	8.5
50	-1.43	17.54	31.69	25.51	8.81	102.8	11.7
75	-1.39	17.90	32.40	26.03			19.0
100	-1.35	18.13	32.76	26.36	7.07	83.5	23.0
125	-1.42	18.29	33.04	26.60			28.2
150	-1.48	18.47	33.37	26.86	6.80	80.4	24.2
200	-0.64	-----			6.36	76.8	16.8
250	-0.03	19.18	34.65	27.84			12.5
300	0.21	19.25	34.78	27.94	6.52	81.4	12.2
350	0.35	19.29	34.85	27.99			11.8
400	0.41	19.30	34.87	28.00	6.76	84.8	10.0
450	0.45	19.31	34.89	28.00			9.9
500	0.40	19.32	34.90	28.03	6.93	87.0	10.0
600	0.31	19.33	34.92	28.04	7.01	87.8	11.0
700	0.20	19.34	34.94	28.07			9.8
800	0.08	19.34	34.94	28.08	7.06	87.9	9.5
1000	-0.14	19.35	34.96	28.10			
1046	-0.19	19.36	34.98	28.11	7.09	87.8	9.4

STATION 16

Date: 2/10/60

Time: 1807-2242

Latitude: 71°35' N

Longitude: 149°59' W

Depth: ca. 1800 m

Weather: 02

Wind: 360° Speed 5 kts

Cloud: Ac, 10

Temp.: Dry -31.8°C Wet -31.9°C

Depth m	Temp. °C	Chlor. o/oo	Sal. o/oo	Sigma-T	Oxygen ml / l	%	Si µg-at/l
1	-1.60	17.82	32.19	25.92	7.29	85.1	16.8
10	-1.33	18.02	32.56	26.21	6.87	81.0	19.7
20	-1.42	18.10	32.70	26.32	6.79	79.9	11.7
30	-1.32	18.11	32.73	26.34	6.79	80.0	19.8
50	-1.55	18.19	32.86	26.45	6.98	81.9	20.5
75	-1.44	18.25	32.96	26.53	7.36	86.8	22.0
100	-1.49	18.27	33.00	26.56	7.02	82.8	22.5
125	-1.43	18.29	33.04	26.60	6.78	80.0	22.0
150	-1.42	18.34	33.13	26.67	6.65	78.5	21.0
175	-1.40	18.41	33.26	26.77	6.57	77.7	20.3
200	-0.63	18.95	34.24	27.53	5.85	71.0	16.7
250	-0.11	19.18	34.65	27.85	5.78	71.4	13.9
300	0.06	19.22	34.72	27.90	5.95	74.1	11.8
350	0.28	19.27	34.81	27.95	6.17	77.2	10.0
400	0.39	19.30	34.87	28.00	6.34	79.4	10.0
450	0.40	19.32	34.90	28.03	6.41	80.4	9.4
500	0.36	19.33	34.92	28.04	6.53	81.8	9.8
600	0.25	19.33	34.92	28.04	6.60	82.6	7.9
750	0.12	19.34	34.94	28.07	6.62	82.5	7.2
950	-0.09	19.34	34.94	28.09	6.65	82.5	9.0

STATION 17

Date: 2/22/60

Time: 1810-2317

Latitude: 72°02' N

Longitude: 152°49' W

Depth: 1890 m

Weather: 03

Wind: 80° Speed 10 kts

Cloud: As, 4

Temp.: Dry -29.8°C Wet -30.0°C

1	-1.68	17.28	31.22	25.13	8.19	94.6	9.6
10	-1.68	17.28	31.22	25.13	8.30	95.8	9.4
20	-1.70	17.28	31.22	25.13	8.16	94.1	9.4
30	-1.65	17.28	31.22	25.13	8.15	94.2	8.4
50	-1.63	17.30	31.26	25.15	8.11	93.9	9.2
75	-1.08	17.91	32.36	26.04	8.08	95.6	15.7
100	-1.29	18.12	32.74	26.35	6.49	76.8	19.2
125	-1.40	18.28	33.03	26.59	6.36	75.1	24.0
150	-1.47	18.43	33.30	26.81	6.20	73.2	23.0
175	-1.18	18.69	33.77	27.19	5.97	71.2	21.4
200	-0.63	18.95	34.24	27.54	5.85	71.1	15.8
250	-0.08	19.20	34.69	27.88	5.95	73.8	11.9
300	0.26	19.27	34.81	27.95	6.19	77.4	9.9
350	0.41	19.28	34.83	27.97	6.40	80.4	8.4
400	0.45	19.30	34.87	27.99	6.47	81.3	10.0
450	0.48	19.31	34.89	28.00	6.45	81.1	9.5
500	0.43	19.31	34.89	28.00	6.56	82.3	9.6
600	0.31	19.32	34.90	28.03	6.62	82.9	7.7
700	0.20	19.32	34.90	28.04	6.57	82.0	7.5
900	-0.03	19.33	34.92	28.06	6.70	83.1	7.7
1000	-0.10	19.33	34.92	28.07	6.69	83.0	8.1
1400	-0.32	19.34	34.94	28.10	6.44	79.4	9.6
1841	-0.43	19.35	34.96	28.12	6.23	76.7	27.7

STATION 21

Date: 5/23/60

Time: 1940-1951

Latitude: 71°50' N

Longitude: 160°22' W

Depth: 41 m

Weather: 02

Wind: 122° Speed 6 kts

Cloud: St, 10

Temp.: Dry -2.1°C Wet -2.2°C

Depth m	Temp. °C	Chlor. o/oo	Sal. o/oo	Sigma-T	Oxygen ml / l	%	Si µg-at/l
1	-1.58	18.14	32.76	26.37	7.84	91.9	19.7
10	-1.57	18.19	32.86	26.45	7.84	91.9	19.5
15	-1.79	18.19	32.86	26.45	7.84	91.5	19.3
20	-1.76	18.19	32.86	26.46	7.86	91.8	19.8
30	-1.76	18.20	32.88	26.47	7.84	91.6	19.5
41	-1.82	18.41	33.27	26.79	7.25	84.6	26.7

STATION 22

Date: 6/8/60

Time: 2023-2115

Latitude: 71°50' N

Longitude: 160°22' W

Depth: 41 m

Weather: 02

Wind: 50° Speed 8 kts

Cloud: St, 9; Ci, 1

Temp.: Dry -1.2°C Wet -2.0°C

1	-1.50	17.41	31.45	25.31	8.05	93.6	21.4
5	-1.54	18.02	32.56	26.21	7.94	93.0	18.3
10	-1.44	18.13	32.75	26.36	7.92	93.2	19.1
15	-1.57	18.19	32.87	26.46	7.84	92.0	20.8
20	-1.62	18.32	33.09	26.65	7.68	90.6	23.6
25	-1.78	18.42	33.27	26.80	7.45	87.1	27.6
30	-1.78	18.54	33.50	26.98	7.33	85.8	29.1
35	-1.81	18.66	33.71	27.15	7.15	83.9	32.1
40	-1.85	18.70	33.78	27.21	7.12	83.8	32.9

STATION 23

Date: 6/15/60

Time: 2012-2030

Latitude: 71°50' N

Longitude: 160°22' W

Depth: 41 m

Weather: 02

Wind: Calm

Cloud: St, 10

Temp.: Dry -1.4°C Wet -1.8°C

1	-1.66
5	-1.68
15	-1.70
20	-1.66
30	-1.74
40	-1.88

STATION 24

Date: 6/22/60

Time: 1955-2036

Latitude: 71°50' N

Longitude: 160°20' W

Depth: 41 m

Weather: 02

Wind: 220° Speed 12 kts

Cloud: St, 10

Temp.: Dry 1.0°C Wet 0.9°C

1	-1.58
5	-1.74
10	-1.73
15	-1.67
20	-1.68
25	-1.68
30	-1.71
35	-1.76
40	-1.85

STATION 28

Date: 7/20/60

Time: 2321-2441

Latitude: 71°49.5' N

Longitude: 159°45' W

Depth: 48 m

Weather: 02

Wind: 339° Speed 4 kts

Cloud: Ci, 2

Temp.: Dry 1.6°C Wet 0.9°C

Depth m	Temp. °C	Chlor. o/oo	Sal. o/oo	Sigma-T	Oxygen ml / l	%	Si µg-at/l
1	0.12	0.08	0.17	0.01	9.31	90.9	19.8
3	0.10	0.09	0.19	0.01	9.45	92.3	9.8
5	-1.53	17.42	31.47	25.33	9.22	107.1	15.0
10	-1.68	17.65	31.88	25.67	9.64	111.8	12.9
15	-1.71	17.75	32.07	25.82	9.26	107.5	13.4
20	-1.76	18.11	32.72	26.34	7.93	92.5	20.4
25	-1.78	18.28	33.03	26.60	7.48	87.3	25.5
30	-1.85	18.42	33.27	26.80	6.80	79.4	33.9
35	-1.84	18.47	33.37	26.88	6.83	79.9	32.0
47	-1.76	18.57	33.55	27.04	6.74	79.1	34.8

STATION 29

Date: 7/27/60

Time: 2234-2339

Latitude: 71°52.5' N

Longitude: 160°20' W

Depth: 40 m

Weather: 02

Wind: 143° Speed 16 kts

Cloud: St, 9

Temp.: Dry -0.1°C Wet -0.3°C

1	-0.05
3	-0.07
5	-1.62
10	-1.66
15	-1.74
20	-1.75
25	-1.81
30	-1.84
35	-1.81

STATION 30

Date: 8/3/60

Time: 1913-2011

Latitude: 71°51.7' N

Longitude: 160°20' W

Depth: 39.6 m

Weather: 42

Wind: Calm

Cloud: St, 10

Temp.: Dry 0.6°C Wet 0.0°C

1	-0.10
3	-0.18
5	-1.70
10	-1.54
15	-1.68
20	-1.75
25	-1.76
30	-1.80
35	-1.81
39	-1.77

STATION 34

Date: 8/25/60

Time: 1854-1950

Latitude: 71°51.7' N

Longitude: 160°20' W

Depth: 38.1 m

Weather:

Wind:

Cloud:

Temp.: Dry Wet

Depth m	Temp. °C	Chlor. o/oo	Sal. o/oo	Sigma-T	Oxygen ml / l	%	Si µg-at/l
1	-0.93	9.63	17.42	13.97			
3	-1.19	14.59	26.37	21.20			
5	-1.18	14.71	26.58	21.37			
10	-1.17	14.88	26.89	21.62			
15	-1.57	16.50	29.81	23.98			
20	-1.69	17.91	32.36	26.05			
25	-1.70	18.02	32.56	26.21			
30	-1.75	18.26	32.99	26.57			
35	-1.81	18.45	33.33	26.84			
37	-1.78	18.45	33.33	26.84			

STATION 35

Date: 9/5/60

Time: 2030-2400

Latitude: 71°51.7' N

Longitude: 160°20' W

Depth: 38.5 m

Weather:

Wind:

Cloud:

Temp.: Dry Wet

1	-1.62	15.79	28.55	22.95	9.27	105.0	9.0
3	-1.38	16.33	29.51	23.74	8.92	102.6	10.4
5	-1.36	16.33	29.51	23.74	8.88	102.2	9.9
10	-0.97	16.51	29.83	23.99	8.88	103.5	8.2
15	-0.77	16.79	30.34	24.40	9.30	109.2	9.4
20	-1.52	17.79	32.14	25.87	8.58	100.1	19.0
25	-1.74	18.23	32.93	26.52	7.60	88.8	25.2
30	-1.79	18.38	33.21	26.75	6.80	79.5	32.0
35	-1.76	18.49	33.41	26.91	6.33	74.2	37.2
37	-1.73	18.50	33.42	26.92	6.31	74.1	38.0

STATION 4

Date: 6/17/59

Time: 2215-0254 (18th)

Latitude: 72°04'

Longitude: 130°57' W

Depth: 780 m

Weather: 44

Wind: 29° Speed 4 kts

Cloud: St, 10

Temp.: Dry -0.8°C Wet -1.2°C

Depth	Temp	Chlor.	Sal.	Sigma-T	Oxygen	Si
m	°C	o/oo	o/oo		ml/l	µg-at/l
0	0.08	0.74	1.37	0.80		
10	-1.72	17.32	31.29	25.19	9.10	105.0
20	-1.66	17.38	31.40	25.27	8.96	103.7
30	-1.65	17.40	31.44	25.30	8.88	102.8
50	-1.67	17.42	31.47	25.33	8.89	102.9
75	-1.41	17.74	32.05	25.80	7.56	89.0
100	-1.44	18.04	32.59	26.23	6.51	76.9
125	-1.44	18.23	32.94	26.52	6.16	72.8
150	-1.39	18.44	33.30	26.81	5.95	70.6
175	-1.07	18.72	33.82	27.22	5.89	70.8
200	-0.69	18.96	34.23	27.55		
250	-0.03	19.16	34.61	27.86	5.69	70.6
300	0.22	19.25	34.78	27.94	5.90	73.6
340	0.34	19.28	34.84	27.98		

STATION 5

Date: 6/30/59

Time: 1646-2148

Latitude: 71°58' N

Longitude: 138°27' W

Depth: 1480 m

Weather: 02

Wind: 97° Speed 5 kts

Cloud: 0

Temp.: Dry 1.8°C Wet 0.2°C

0	0.12	0.56	1.04	0.76	8.64	84.8	3.6
10	-1.63	17.35	31.35	25.23	8.89	102.9	6.1
20	-1.72	17.35	31.35	25.23			6.2
30	-1.68	17.37	31.38	25.26	8.60	99.3	5.4
40	-1.66	17.37	31.38	25.26			5.0
50	-1.65	17.39	31.42	25.29	8.08	93.4	5.6
75	-1.47	17.68	31.94	25.71			6.8
100	-1.39	17.98	32.48	26.15	6.46	76.0	16.8
125	-1.46	18.21	32.90	26.48			24.9
150	-1.40	18.39	33.72	26.74	5.97	70.7	20.2
175	-1.20	18.68	33.75	27.17			10.4
200	-0.78	18.91	34.16	27.48	5.75	69.5	15.1
250	-0.28	19.13	34.56	27.78			10.7
300	-0.05	19.23	34.74	27.92	6.09	75.9	12.3
350	0.29	19.26	34.79	27.94			10.9
400	0.36	19.29	34.85	27.99	6.14	77.1	9.8
450	0.41	19.30	34.87	28.00			7.8
500	0.38	19.31	34.88	28.01	6.35	79.8	8.3
600	0.31	19.31	34.88	28.01	6.60	82.5	8.3
700	0.18	19.31	34.88	28.02			10.9
800	0.09	19.32	34.90	28.04	6.65	82.8	9.6
1000	-0.11	19.33	34.92	28.07	6.56	81.3	8.3
1200	-0.25	19.35	34.96	28.10			8.3
1374	-0.37	19.35	34.96	28.11			8.6

STATION 6a

Date: 7/23/59

Time: 1945-2420

Latitude: 71°40' N

Longitude: 133°14'

Depth:

Weather: 45

Wind: 84° Speed 6 kts

Cloud: F, 10

Temp.: Dry 0.5°C Wet 0.2°C

Depth	Temp	Chlor.	Sal.	Sigma-T	Oxygen	Si
m	°C	o/oo	o/oo		ml / l	µg-at/l
778	0.09	19.33	34.91	28.05		
875	-0.02	19.33	34.92	28.06		
972	-----	19.32	34.90			
1070	-0.17	19.21?				
1167	-0.24	19.34	34.93	28.08		
1265	-0.30	19.35	34.92	28.08		

STATION 7

Date: 7/24/59

Time: 1840-2328

Latitude: 71°33'

Longitude: 133°25' W

Depth:

Weather: 02

Wind: 250° Speed 5 kts

Cloud: Sc, 10

Temp.: Dry -0.4°C Wet -0.7°C

0	0.50	0.02	0.07	-0.02	9.67	95.3	2.8
5	-0.25	0.66	1.22	0.91			2.3
10	-1.46	16.99	30.70	24.70			5.0
25	-1.57	17.23	31.12	25.05	9.25	107.1	6.4
50	-1.65	17.39	31.42	25.29	9.00	104.0	7.0
75	-1.40	17.83	32.21	25.93			13.5
100	-1.40	18.09	32.68	26.31	6.71	78.9	21.0
125	-1.50	18.29	33.04	26.60			25.6
150	-1.52	18.42	33.28	26.80	6.72	79.0	20.2
175	-1.49	18.49	33.40	26.89			22.5
200	-1.26	18.62	33.64	27.08	6.31	75.2	18.3
250	-0.36	19.08	34.47	27.71	6.05	74.2	13.2
300	0.07	19.21	34.70	27.88	6.14	76.3	11.8
350	0.28	19.26	34.79	27.94			12.0
400	0.37	19.28	34.83	27.97	6.37	78.3	9.2
450	0.40	19.30	34.86	28.00			7.7
500	0.39	19.31	34.88	28.01	6.65	83.4	8.8
600	0.30	19.32	34.90	28.03	6.74	84.2	8.7
800	0.08	19.32	34.90	28.05	6.84	85.2	8.5
900	-0.02	19.32	34.90	28.05			9.6
1000	-0.12	19.33	34.92	28.07	6.68	82.7	9.7
1100	-0.21	19.34	34.94	28.09			9.7
1200	-0.27	19.34	34.94	28.10	6.67	82.3	9.7
1275	-0.32	19.34	34.94	28.10			10.7

STATION 10

Date: 9/9/59

Time: 2145-2304

Latitude: 71°43' N

Longitude: 136°48'

Depth:

Weather: 02

Wind: 344° Speed 16 kts

Cloud: Sc, Cl 2

Temp.: Dry -2.2°C Wet -2.8°C

Depth m	Temp. °C	Chlor. o/oo	Sal. o/oo	Sigma-T	Oxygen ml/l	%	Si µg-at/l
1470	-0.33	19.36	34.97	28.12	6.62	81.5	9.2
1568	-0.37	19.36	34.97	28.12			9.1
1759	-0.40	19.36	34.97	28.12			10.1
1959	-0.41	19.36	34.97	28.12			10.1
2058	-0.41	19.36	34.98	28.13	6.45	79.4	12.7

STATION 11

Date: 11/19/59

Time: 2110-0250(20th)

Latitude: 71°09' N

Longitude: 144°00' W

Depth: 2378 m

Weather: 02

Wind: 135° Speed 10 kts

Cloud: 0

Temp.: Dry

Wet

1	-1.45	15.05	27.20	21.89	9.66	108.9
10	-1.50	15.09	27.27	21.93	9.68	108.9
20	-1.30	16.76	30.28	24.36	9.79	113.3
30	-1.50	17.37	31.39	25.26	9.57	111.2
50	-1.43	17.46	31.54	25.38	8.88	103.5
75	-1.36	17.92	32.38	26.06	7.45	87.5
100	-----	18.12	32.74			
125	-1.43	18.27	33.00	26.57	6.99	82.4
150	-1.50	18.45	33.33	26.84	6.48	76.5
200	-0.56	19.01	34.34	27.61	6.44	78.4
250	-0.02	19.22	34.72	27.90	6.62	82.0
300	0.27	19.29	34.85	27.99	6.74	84.5
350	0.39	19.32	34.90	28.03		
400	0.43	19.32	34.90	28.03	6.87	86.3
450	0.46	19.33	34.92	28.03		
500	0.40	19.34	34.94	28.06	7.14	89.7
600	0.31	19.34	34.94	28.06		
700	0.18	19.35	34.96	28.08	7.25	90.5
800	0.07	19.34	34.94	28.08		
1000	-0.13	19.34	34.94	28.09	7.15	88.6
1200	-0.28	19.35	34.96	28.11	7.14	88.0
1500	-0.37	19.36	34.98	28.12	6.94	85.6
1800	-0.41	19.37	34.99	28.14		
2000	-0.43	19.37	34.99	28.14	6.81	83.8

STATION 14

Date: 1/11/60

Time: 2045-2315

Latitude: 71°02' N

Longitude: 145°15' W

Depth: < 900 m

Weather: 02

Wind: 180° Speed 4 kts

Cloud: 0

Temp.: Dry -40.4°C Wet -40.4°C

Depth m	Temp. °C	Chlor. o/oo	Sal. o/oo	Sigma-T	Oxygen ml / l	%	Si µg-at/l
1	-1.57	15.56	28.12	22.62	9.23	104.4	7.1
10	-1.55	15.54	28.08	22.58	9.15	103.5	6.5
20	-1.51	16.39	29.61	23.83			6.6
30	-1.47	17.38	31.39	25.27	8.05	93.6	7.1
50	-1.25	17.65	31.90	25.67	8.94	104.9	11.0
75	-1.20	17.94	32.41	26.07			16.9
100	-1.31	18.14	32.77	26.38	6.93	82.0	20.0
125	-1.41	18.26	32.99	26.56	7.06	83.1	21.8
150	-1.48	18.42	33.28	26.79	6.55	77.4	19.9
200	-0.47	19.01	34.34	27.61	5.99	73.2	15.3
250	-0.03	19.19	34.67	27.86			12.0
300	0.14	19.23	34.74	27.91	6.16	76.7	10.9
350	0.26	19.26	34.79	27.94			9.4
400	0.36	19.28	34.83	27.97	6.41	80.3	9.4
450	0.43	19.30	34.87	27.99			9.6
500	0.45	19.31	34.89	28.00	6.57	82.5	8.5
600	0.38	19.32	34.90	28.03	6.70	84.1	8.5
800	0.22	19.33	34.92	28.05	6.73	84.1	8.2

STATION 15

Date: 1/30/60

Time: 1955-0211 (31st)

Latitude: 71°02' N

Longitude: 145°38' W

Depth: 775 m

Weather: 02

Wind: 55° Speed 13 kts

Cloud: Ac, 5; Cs 5

Temp.: Dry -34.9°C Wet -35.0°C

1	-1.43	15.58	28.15	22.64	9.01	102.3	6.7
10	-1.59	16.30	29.45	23.70	9.03	103.1	6.2
20	-1.56	16.93	30.59	24.60	8.99	103.6	6.1
30	-1.41	17.46	31.54	25.38	8.53	99.4	8.2
50	-1.13	17.75	32.06	25.81	7.40	87.4	13.9
75	-1.22	17.98	32.48	26.14	6.80	80.3	18.5
100	-1.27	18.16	32.81	26.41	6.68	79.0	19.0
125	-1.35	18.26	32.99	26.56	6.69	79.1	23.1
150	-1.48	18.37	33.19	26.73	6.25	73.8	24.6
200	-1.24	-----	-----	-----			16.4
250	-0.03	19.18	34.65	27.84			12.4
300	0.21	19.25	34.78	27.94			10.7
350	0.30	19.28	34.83	27.97	6.18	77.3	9.8
400	0.35	19.29	34.85	27.99	6.18	77.4	9.0
450	0.39	19.30	34.87	28.00	6.29	78.9	9.8
500	0.42	19.31	34.89	28.01	6.32	79.3	9.8
600	0.36	19.33	34.92	28.04	6.36	79.7	9.1
750	0.21	19.33	34.92	28.05	6.48	81.1	9.2

STATION 18

Date: 3/7/60

Time: 1812-2317

Latitude: 71°47' N

Longitude: 150°30' W

Depth: 2504 m

Weather: 02

Wind: Calm

Cloud: 0

Temp.: Dry -30.0°C Wet -30.1°C

Depth m	Temp. °C	Chlor. o/oo	Sal. o/oo	Sigmat-T	Oxygen ml/l	%	Si µg-at/l
1	-1.62	16.61	30.01	24.15	8.95	101.5	10.0
10	-1.63	16.60	29.99	24.14	8.92	102.2	6.5
20	-1.66	16.61	30.01	24.15	8.86	101.5	
30	-1.58	16.76	30.28	24.36	8.82	101.4	7.0
50	-1.39	17.45	31.53	25.37	8.81	102.8	9.8
75	-1.18	17.85	32.24	25.95	7.02	82.9	17.7
100	-1.24	18.05	32.62	26.25	6.73	79.5	18.9
125	-1.28	18.19	32.86	26.45	6.63	78.4	22.5
150	-1.47	18.29	33.04	26.60	6.46	76.2	23.2
175	-1.32	18.54	33.50	26.96	5.89	69.9	21.6
200	-0.86	18.86	34.07	27.41	5.94	71.7	17.9
250	-0.13	19.16	34.61	27.82			11.5
300	0.23	19.24	34.76	27.92	6.23	77.7	9.6
350	0.39	19.28	34.83	27.97	6.36	79.6	8.0
400	0.50	19.29	34.85	27.98	6.43	80.9	9.6
450	0.52	19.30	34.87	27.99	6.51	81.9	9.4
500	0.47	19.30	34.87	27.99	6.63	83.3	7.5
600	0.33	19.31	34.89	28.01	6.64	83.2	8.0
800	0.07	19.32	34.90	28.04	6.74	83.1	6.5
1000	-0.12	19.33	34.92	28.07	6.71	83.1	9.0
1200	-0.23	19.34	34.94	28.09	6.75	83.4	8.1
1500	-0.36	19.34	34.94	28.10	6.74	81.9	10.3
2000	-0.43	19.35	34.96	28.11	6.48	79.7	10.3

STATION 19

Date: 5/13/ 60

Time: 2140-2209

Latitude: 71°50' N

Longitude: 159°38' W

Depth: 50 m

Weather: 02

Wind: 120° Speed 8 kts

Cloud: St, 10

Temp.: Dry -2.8°C Wet -3.2°C

1	-1.65
10	-1.75
15	-1.76
20	-1.72
30	-1.72
45	-1.78

STATION 20

Date: 5/16/60

Time: 2248-2347

Latitude: 71°51' N

Longitude: 159°40' W

Depth: 52 m

Weather: 02

Wind: 32° Speed 15 kts

Cloud: 0

Temp.: Dry -5.9°C Wet -6.7°C

1	-1.72	17.90	32.34	26.03	7.83	91.0	15.4
5	-1.74	17.91	32.35	26.05	7.84	91.3	16.7
10	-1.76	17.91	32.36	26.06	7.85	91.2	13.0
15	-1.71	17.92	32.37	26.07	7.82	91.0	15.7
20	-1.71	17.92	32.37	26.07	7.79	90.7	16.2
25	-1.76	17.92	32.38	26.07	7.71	89.6	15.7
30	-1.75	17.94	32.41	26.09	7.75	90.2	15.9
35	-1.75	17.98	32.49	26.16	7.70	89.9	17.0
45	-1.82	18.19	32.86	26.46	6.69	78.1	25.5

STATION 25

Date: 6/30/60Time: 1855-1947Latitude: 71°50' NLongitude: 160°22' WDepth: 41 mWeather: 45Wind: CalmCloud: Fc, 10Temp.: Dry 1.4°C Wet 1.2°C

Depth m	Temp. °C	Chlor. o/oo	Sal. o/oo	Sigma-T	Oxygen ml / l	%	Si µg-at/l
1	-0.27	2.95	5.35	4.24	9.42	93.9	6.8
3	-0.29	3.00	5.45	4.31	9.45	94.2	7.2
5	-1.44	14.25	25.75	20.70	8.28	92.3	19.8
10	-1.68	18.10	32.70	26.32	7.91	92.5	22.8
15	-1.71	18.17	32.82	26.42	7.88	92.1	25.6
20	-1.77	18.23	32.93	26.52	7.87	91.9	26.8
25	-1.77	18.28	33.02	26.60	7.86	91.7	27.6
30	-1.76	18.44	33.32	26.82	7.73	90.6	30.2
35	-1.84	18.60	33.60	27.07	7.50	87.9	34.5
40	-1.78	18.60	33.60	27.07	7.46	87.5	21.4

Date: 7/6/60Time: 1943-2024

STATION 26

Latitude: 71°50' NLongitude: 160°22' WDepth: 41 mWeather: 45Wind: 45° Speed 3 ktsCloud: St, 10Temp.: Dry 1.1°C Wet 0.9°C

1	0.01
3	-0.07
5	-0.25
10	-1.61
15	-1.67
20	-1.69
25	-1.74
30	-1.78
35	-1.79
40	-1.79

STATION 27

Date: 7/13/60Time: 2303-2350Latitude: 71°50' NLongitude: 160°22' WDepth: 41 mWeather: 45Wind: 230° Speed 4 ktsCloud: Fc, 4; Cl, 4Temp.: Dry 2.2°C Wet 2.0°C

1	0.04
3	0.03
5	-0.58
10	-1.63
15	-1.64
20	-1.69
25	-1.75
30	-1.77
35	-1.70
40	-1.80

STATION 31

Date: 8/10/60Time: 1921-2018Latitude: 71°51.7' NLongitude: 160°20' WDepth: 39.5 mWeather: 43Wind: 93° Speed 2 ktsCloud: St, 10Temp.: Dry 0.8°C Wet 0.6°C

Depth m	Temp. °C	Chlor. o/oo	Sal. o/oo	Sigma-T	Oxygen ml/l	%	Si µg-at/l
1	-0.08						
3	-0.36						
5	-1.53						
10	-1.65						
15	-1.70						
20	-1.75						
25	-1.76						
30	-1.80						
35	-1.81						

STATION 32

Date: 8/17/60Time: 1850-2024Latitude: 71°51.7' NLongitude: 160°20' WDepth: 38.3 mWeather: 02Wind: 55° Speed 10 ktsCloud: St, 10Temp.: Dry -0.3°C Wet -0.5°C

1	-0.26	3.29	5.97	4.74	9.47	95.0	6.5
3	-1.58	12.57	22.72	18.25	8.93	97.0	11.7
5	-1.63	16.65	30.08	24.21	8.50	97.5	15.4
10	-1.61	16.71	30.19	24.30	8.53	98.0	12.2
15	-1.66	17.00	30.72	24.72	8.38	96.7	14.3
20	-1.69	17.21	31.09	25.03	8.27	95.4	18.0
25	-1.73	18.19	32.87	26.46	7.96	93.0	24.4
30	-1.85	18.49	33.41	26.91	6.55	76.7	32.2
35	-1.80	18.53	33.48	26.97	6.28	73.6	33.6
37.5	-1.78	18.53	33.48	26.97	6.22	73.0	36.5

STATION 33

Date: 8/24/60Time: 2000-2052Latitude: 71°51.7' NLongitude: 160°20' WDepth: 38.1 mWeather: 02Wind: 100° Speed 13 ktsCloud: St, 10Temp.: Dry -1.8°C Wet -1.9°C

1	-0.76
3	-1.26
5	-1.31
10	-1.36
15	-1.60
20	-1.70
25	-1.72
30	-1.82
35	-1.78
37	-1.77

4.3 Charlie Oceanography

TEMPERATURE - Ten Nansen sampling bottles were available; each carried two protected and one unprotected reversing thermometers. Subsurface temperatures were derived from the mean of the readings of the protected instruments.

DEPTH Ocean depths were obtained from a precision depth recorder (PDR) or seismic reflection shots.

SALINITY Samples were stored in citrate bottles and later run on a salinity bridge at the Department of Oceanography, University of Washington.

OXYGEN Determinations were made in the field using the modified Winkler method of Thompson and Robinson²² (1939) with a photoelectric colorimeter (Ford,⁸ 1950).

SILICATES (inorganic dissolved) Concentrations were obtained using sodium fluosilicate standards and a photoelectric colorimeter (Robinson and Thompson,²⁰ 1948b). Measurements were concurrent with those of dissolved oxygen.

STATION 1

Date: 6/27/59

Time: 2200

Latitude: 77°02' N

Longitude: 159°39' W

Depth: 2107 m

Wind: 2 kts, Dir. 201°

Weather: 2

Bar.: 1019

Temp.: Dry 1.1°, Wet 0.2°

Cloud: 4, amt. 2

Depth	T	S	Sigma-T		O ₂		P	Si
m	°C	o/oo		µg A/l	ml/l	%	µg A/l	µg A/l
5	-1.28	30.728	24.73	0.782	8.76	104		
10	-1.41	30.737	24.74	0.812	9.09	108		
30	-1.32	30.845	24.82	0.814	9.12	109		
50	-1.29	31.136	25.06	0.782	8.76	105		
75	-0.95	31.803	25.59	0.713	7.99	97		
95	-1.29	32.211	25.93	0.648	7.26	87		
100	-1.29	32.237	25.95	0.634	7.10	86		
150	-1.44	32.897	26.48	0.594	6.65	80		
220	-1.32	33.522	26.99	0.574	6.43	78		
300	-0.04	34.670	27.86	0.558	6.25	79		
375	0.44	34.805	27.94	0.548	6.14	79		
380	-----	34.838	-----	0.600	6.72	---		
400	0.48	34.879	28.00	0.590	6.61	85		
600	0.36	34.892	28.02	0.608	6.81	87		
700	0.20	34.895	28.03	0.617	6.91	88		
800	0.06	34.903	28.05	0.612	6.85	87		
900	-0.04	34.903	28.05	0.604	6.76	86		
1000	-0.10	34.904	28.05	0.598	6.70	85		
1200	-0.22	34.919	28.07	0.595	6.66	84		
1461	-0.33	34.933	28.09	0.588	6.59	83		
1545	-0.35	34.941	28.10	0.592	6.63	84		
1705	-0.34	34.944	28.10	0.595	6.66	84		
1832	-0.34	34.944	28.10	0.578	6.47	82		

STATION 2

Date: 6/29/59

Time: 2300

Latitude: 77°24' N

Longitude: 159°50' W

Depth: 2107 m

Wind: 2 kts, Dir. 202°

Weather: 45

Bar.: 1011

Temp.: Dry 0.9°, Wet 0.9°

Cloud: X, amt. 9

10	-1.60	30.457	24.51	0.826	9.25	109	0.57
25	-1.58	30.666	24.68	0.792	8.87	105	0.68
50	-0.84	31.645	25.46	0.748	8.38	102	0.78
75	-1.07	32.116	25.84	0.666	7.46	90	1.00
100	-1.53	32.363	26.05	0.621	6.96	83	1.13
150	-1.48	32.664	26.30	0.599	6.71	81	1.43
200	-1.46	33.311	26.82	0.590	6.61	80	1.43
300	-0.04	34.681	27.87	0.564	6.32	80	1.41
400	0.47	34.847	27.98	0.597	6.69	86	1.41
500	0.52	34.876	28.00	0.601	6.73	87	1.42

STATION 3

Date: 7/01/59

Time: 2300

Latitude: 77°10' N

Longitude: 159°50' W

Depth: 2000 m

Wind: 7 kts, Dir. 100°

Weather: 45

Bar.: 990

Temp.: Dry 0.5°, Wet 0.2°

Cloud: X, amt. 9

Depth m	T °C	S o/oo	Sigma-T µg A/1	O ₂ ml/1	%	P µg A/1	Si µg A/1
10	-1.70	30.545	24.59	0.834	9.34	110	1.22
20	-1.52	30.664	24.68	0.815	9.13	108	1.32
30	-1.22	31.311	25.20	0.788	8.83	106	1.37
50	-1.02	31.980	25.73	0.677	7.58	92	1.78
75	-1.54	32.220	25.94	0.636	7.12	85	2.05
100	-1.76	32.401	26.09	0.620	6.94	83	2.16
100	-1.72	32.368	26.06	0.624	6.99	83	2.04
200	-1.46	33.128	26.67	0.600	6.72	81	2.22
400	0.48	34.843	27.97	0.592	6.63	85	1.51
600	0.40	34.894	28.02	0.604	6.76	87	1.61
800	0.08	34.903	28.04	0.617	6.91	88	1.60
1000	-0.12	34.910	28.06	0.614	6.88	87	1.55

STATION 4

Date: 7/06/59

Time: 2000

Latitude: 77°24' N

Longitude: 160°10' W

Depth: 1950 m

Wind: 8 kts, Dir. 03°

Weather: 73

Bar.: 990

Temp.: Dry 0.2°, Wet 0.2°

Cloud: X, amt. 9

5	-1.59	30.554	24.59	0.832	9.32	110	1.18	12
10	-1.58	30.650	24.67	0.837	9.37	111	1.18	16
20	-1.60	30.684	24.70	0.838	9.39	111	1.18	19
30	-1.60	30.883	24.86	0.807	9.04	107	1.38	39
50	-1.23	31.343	25.22	0.798	8.94	107	1.34	29
75	-1.11	31.944	25.70	0.688	7.71	93	1.72	26
80	-1.19	31.977	25.73	0.674	7.55	91	1.75	35
100	-1.31	32.417	26.09	0.624	6.99	84	1.98	39
125	-1.52	32.823	26.43	0.596	6.68	80	1.96	39
150	-1.58	33.034	26.60	0.564	6.32	76	2.21	51
175	-1.66	33.157	26.70	0.537	6.01	72	2.31	42
200	-1.49	33.348	26.85	0.572	6.41	77	2.07	39

STATION 5

Date: 7/08/59

Time: 2300

Latitude: 77°30' N

Longitude: 160°30' W

Depth: 1463 m

Wind: 4 kts, Dir. 200°

Weather: 2

Bar.: 1003

Temp.: Dry -0.2°, Wet -0.4°

Cloud: 4, amt. 8

20	-1.60	30.625	24.65	0.835	9.35	110	1.12	8
50	-1.20	31.312	25.20	0.792	8.87	106	1.24	17
75	-1.00	31.908	25.67	0.688	7.71	93	1.60	29
100	-1.32	32.307	26.00	0.637	7.13	86	1.94	31
150	-1.49	32.912	26.50	0.597	6.69	80	2.03	34
200	-1.33	33.587	27.04	0.574	6.43	78	2.03	35
250	-0.50	34.441	27.70	0.550	6.16	77	1.95	26
300	0.01	34.713	27.89	0.566	6.34	81	1.43	23
400	0.47	34.848	27.98	0.600	6.72	87	1.26	25
500	0.54	34.883	28.00	0.608	6.81	88	1.33	27
600	0.36	34.894	28.02	0.615	6.89	88	1.30	22
700	0.18	34.901	28.04	0.615	6.89	88	1.25	19

STATION 6

Date: 7/10/59

Time: 2300

Latitude: 77°40' N

Longitude: 161°00' W

Depth: 880 m

Wind: 7 kts, Dir. 03°

Weather: 26

Bar.: 993

Temp.: Dry 0.2°, Wet 0.2°

Cloud: 4, amt. 7

Depth m	T °C	S o/oo	Sigma-T	$\mu\text{g A/l}$	O ₂ ml/l	%	P $\mu\text{g A/l}$	SI $\mu\text{g A/l}$
20	-1.64	30.901	24.87	0.822	9.21	109	0.89	
50	-1.46	31.349	25.23	0.857	9.60	114	1.02	5
75	-0.84	31.953	25.70	0.706	7.91	96	1.24	18
100	-1.28	32.334	26.02	0.642	7.19	87	1.53	26
125	-1.36	32.617	26.26	0.613	6.87	83	1.44	29
150	-1.54	32.906	26.49	0.600	6.72	81	1.75	30
175	-1.46	32.206	26.74	0.600	6.72	81	1.73	
200	-1.28	33.686	27.12	0.576	6.45	79	1.72	19
225	-0.88	34.134	27.47	0.552	6.18	76	1.44	18
250	-0.43	34.493	27.74	0.546	6.12	77	1.26	16
275	-0.22	34.623	27.83	0.556	6.23	79	1.20	20
300	-0.08	34.697	27.89	0.559	6.26	79	1.15	11
325	0.21	34.756	27.92	0.570	6.38	82	1.13	9
350	0.34	34.785	27.93	0.570	6.38	82	1.12	
400	0.48	34.838	27.97	0.597	6.69	86	1.22	6
450	0.55	34.868	27.99	0.606	6.79	88	1.15	6
500	0.51	34.879	28.00	0.610	6.83	88	1.17	5
600	0.34	34.888	28.02	0.612	6.85	88	1.23	5
700	0.18	34.894	28.03	0.616	6.90	88	1.26	10
800	0.06	34.894	28.04	0.620	6.94	88	1.30	15
900	-0.06	34.903	28.05	0.616	6.90	88	1.31	
1000	-0.14	34.910	28.06	0.610	6.83	87	----	26

STATION 7

Date: 7/13/59

Time: 2300

Latitude: 77°40' N

Longitude: 161°40' W

Depth: -m

Wind: 5 kts, Dir. 07°

Weather: 2

Bar.: 1010

Temp.: Dry 0.2°, Wet 0.2°

Cloud: 5, amt. 7

20	-1.62	30.883	24.86	0.822	9.21	109	0.65	2
30	-1.61	30.892	24.86	0.829	9.28	110	0.75	3
50	-1.12	31.421	25.28	0.780	8.74	105	0.89	12
75	-0.78	-----	-----	0.692	7.75	---	1.19	21
100	-1.28	32.330	26.02	0.638	7.15	86	1.45	22
125	-1.48	32.675	26.31	0.609	6.82	82	1.64	30
150	-1.49	32.926	26.51	0.601	6.73	81	1.48	26
175	-1.46	33.249	26.77	0.598	6.70	81	1.62	28
200	-1.20	33.731	27.15	0.558	6.25	76	1.55	29
225	-0.68	34.283	27.58	0.545	6.10	76	1.28	23
250	-0.44	34.504	27.75	0.542	6.07	76	1.12	19

STATION 8

Date: 7/15/59

Time: 2000

Latitude: 77°40' N

Longitude: 162°10' W

Depth: 576 m

Wind: 7 kts, Dir. 304°

Weather: 73

Bar.: 1006

Temp.: Dry 0.6°, Wet 0.6°

Cloud: 0, amt. 8

Depth m	T C	S o/oo	Sigma-T	$\mu\text{g A/l}$	O ₂ ml/l	%	P $\mu\text{g A/l}$	Si $\mu\text{g A/l}$
30	-1.59	30.876	24.85	0.818	9.16	108	0.53	6
50	-1.23	31.480	25.33	0.768	8.60	103	0.77	13
100	-1.23	32.258	25.96	0.636	7.12	86	1.18	19
125	-1.44	32.646	26.28	0.598	6.70	81	1.36	
150	-1.49	32.937	26.52	0.587	6.57	79	1.42	28
165	-1.65	33.237	26.76	0.593	6.64	80	1.59	26
175	-1.44	33.274	26.79	0.592	6.63	80	1.56	24
200	-1.14	33.793	27.20	0.556	6.23	76	1.37	21
225	-0.68	34.265	27.57	0.543	6.08	76	1.12	23
250	-0.39	34.540	27.77	0.536	6.00	75	0.88	18
275	-0.08	34.648	27.85	0.554	6.20	79	0.87	22
300	0.12	34.726	27.90	0.500	5.60	71	0.85	14

STATION 9

Date: 7/20/59

Time: 2100

Latitude: 77°40' N

Longitude: 164°20' W

Depth: 268 m

Wind: 4 kts, Dir. 200°

Weather: 40

Bar.: 1019

Temp.: Dry 0.6°, Wet 0.4°

Cloud: X, amt. 9

20	-1.61	30.930	24.90	0.835	9.35	111	0.47	5
45	-1.37	31.417	25.29	0.775	8.68	104	0.62	9
50	-1.08	31.520	25.36	0.754	8.44	102	0.68	12
60	-1.18	31.726	25.53	0.721	8.08	97	0.91	16
70	-1.26	31.850	25.63	0.696	7.80	94	0.94	17
75	-1.28	31.921	25.69	0.671	7.52	90	1.01	16
85	-1.11	31.935	25.70	0.670	7.50	91	0.92	17
100	-1.24	32.311	26.01	0.618	6.92	84	1.26	22
140	-1.52	32.867	26.46	0.590	6.61	79	1.44	31
180	-1.47	33.392	26.89	0.590	6.61	80	1.34	30
220	-0.64	34.311	27.60	0.534	5.98	74	0.97	17
250	-0.26	34.616	27.83	0.530	5.94	75	0.84	16

STATION 10

Date: 7/22/59

Time: 2000

Latitude: 77°40' N

Longitude: 164°00' W

Depth: 268 m

Wind: 9 kts, Dir. 160°

Weather: 50

Bar.: 1004

Temp.: Dry 0.1°, Wet -0.1°

Cloud: X, amt. 9

20	-1.58	30.858	24.84	0.818	9.16	108	0.69	4
45	-1.42	31.329	25.21	0.798	8.94	107	0.83	7
50	-1.24	31.376	25.25	0.778	8.71	104	1.03	8
60	-0.82	31.673	25.48	0.734	8.22	100	1.04	14
70	-1.14	31.830	25.61	0.710	7.95	96	1.10	22
75	-0.68	31.850	25.62	0.691	7.74	95	1.11	25
75	-0.96	31.950	25.71	0.688	7.71	93	1.13	22
100	-1.29	32.388	26.07	0.622	6.97	84	1.48	28
140	-1.52	32.901	26.49	0.594	6.65	80	1.62	38
180	-1.47	33.367	26.87	0.597	6.69	81	1.47	35
220	-0.78	34.238	27.55	0.544	6.09	76	1.10	18
250	-0.24	34.583	27.80	0.547	6.13	77	0.92	15

STATION 11 149

Date: 7/26/59 Time: 2300
 Latitude: 77°50' N Longitude: 164°00' W Depth: 270 m
 Wind: 3 kts, Dir. 40° Weather: 26 Bar.: 1003
 Temp.: Dry 00.8°, Wet 00.4° Cloud: X, amt. 9

Depth m	T °C	S o/oo	Sigma-T	O ₂ µg A/l	ml/l	%	P µg A/l	Si µg A/l
52	-1.32	31.746	25.55	0.766	8.58	103		
60	-0.62	31.740	25.52	0.716	8.02	98		
63	-0.62	31.749	25.53	0.715	8.01	98		
65	-0.70	31.812	25.59	0.698	7.82	95		
68	-0.84	31.861	25.63	0.692	7.75	94		
76	-0.99	31.986	25.74	0.668	7.48	91		

STATION 12

Date: 7/29/59 Time: 2000
 Latitude: 77°40' N Longitude: 162°30' W Depth: 280 m
 Wind: 2 kts, Dir. 20° Weather: 45 Bar.: 1030
 Temp.: Dry 01.3°, Wet 00.6° Cloud: X, amt. 9

30	-1.58	31.047	24.99	0.818	9.16	108		
45	-1.26	31.473	25.33	0.772	8.65	104		
53	-1.28	31.619	25.45	0.748	8.38	100		
61	-1.00	31.791	25.58	0.704	7.88	95		
67	-1.09	31.847	25.63	0.694	7.77	94		
76	-1.38	31.977	25.74	0.663	7.43	89		

STATION 13

Date: 8/1/59 Time: 2100
 Latitude: 77°50' N Longitude: 163°20' W Depth: 281 m
 Wind: 7 kts, Dir. 310° Weather: 07 Bar.: 1032
 Temp.: Dry 01.8°, Wet 01.1° Cloud: 4, amt. 4

25	-1.56	31.063	25.00	0.828	9.27	110	0.67	3
45	-1.78	31.639	25.45	0.734	8.22	100	0.95	8
53	-1.20	31.756	25.56	0.706	7.91	95	0.90	11
61	-1.40	31.856	25.64	0.699	7.83	94	0.97	9
67	-1.36	31.906	25.68	0.682	7.64	92	1.04	10
76	-1.44	32.015	25.77	0.658	7.37	88	1.25	13
100	-1.29	32.343	26.03	0.628	7.03	85	1.44	22
130	-1.49	32.800	26.41	0.592	6.63	80	----	29
160	-1.50	33.148	26.69	0.585	6.55	79	1.54	27
200	-1.36	33.654	27.10	0.577	6.46	79	1.44	23
240	-0.53	34.415	27.68	0.538	6.03	75	1.14	16
275	-0.15	34.644	27.85	0.546	6.12	77	0.93	14

STATION 14

Date: 8/3/59 Time: 2100
 Latitude: 77°20' N Longitude: 164°30' W Depth: 314 m
 Wind: 5 kts, Dir 280° Weather: 02 Bar.: 1024
 Temp.: Dry 01.7°, Wet 01.0°

20	-1.49	30.957	24.92	0.756	8.47	100	0.73	6
50	-1.42	31.587	25.42	0.691	7.74	92	0.88	2
75	-1.30	32.016	25.77	0.654	7.32	88	1.21	9
100	-1.27	32.439	26.11	0.615	6.89	83	1.36	14
125	-1.48	32.771	26.38	0.590	6.61	80	1.34	22
150	-1.52	33.110	26.66	0.583	6.53	79	1.43	22
175	-1.83	33.358	26.87	0.653	7.31	88	1.25	22
200	-1.76	33.315	26.99	0.645	7.22	87	1.25	26
225	-0.93	34.067	27.42	0.554	6.20	77	1.26	22
250	-0.42	34.482	27.73	0.535	5.99	75	1.03	12
280	-0.19	34.617	27.83	0.533	5.97	75	0.91	15
300	-0.03	34.682	27.87	0.547	6.13	78	0.90	8

STATION 15

Date: 8/6/59 Time: 2100
Latitude: 77°20' N Longitude: 164°10' W Depth: 257 m
Wind: 7 kts, Dir. 200° Weather: 02 Bar.: 1004
Temp.: Dry 00.6°, Wet 00.4° Cloud: 0, amt. 7

Depth	T	S	Sigma-T	O ₂	P	Si
m	°C	o/oo	µg A/l	ml/l	µg A/l	µg A/l
30	-1.53	31.013	24.96	0.832	9.32	110
50	-1.12	31.569	25.40	0.752	8.42	101
100	-1.27	32.374	26.06	0.620	6.94	84
150	-1.50	33.009	26.58	0.586	6.56	79
170	-1.48	33.246	26.77	0.588	6.59	79
190	-1.39	33.518	26.99	0.588	6.59	80
200	-1.32	33.675	27.11	0.575	6.44	78
220	-0.86	34.132	27.47	0.549	6.15	76
240	-0.50	34.432	27.69	0.538	6.03	75
260	-0.32	34.567	27.79	0.536	6.00	75
270	-0.32	34.563	27.79	0.535	5.99	75
275	-0.29	34.567	27.79	0.531	5.95	75

STATION 16

Date: 8/10/59 Time: 2000
Latitude: 77°10' N Longitude: 163°00' W Depth: 273 m
Wind: 3 kts, Dir. 260° Weather: 01 Bar.: 1016
Temp.: Dry 00.4°, Wet 00.1° Cloud: 4, amt. 7

25	-1.48	30.959	24.92	0.830	9.30	110	0.74	1
50	-1.38	31.569	25.41	0.766	8.58	103	0.92	9
75	-1.36	31.944	25.71	0.678	7.59	91	1.14	12
100	-1.28	32.367	26.05	0.620	6.94	84	1.45	20
125	-1.40	32.702	26.33	0.600	6.72	81	1.56	30
150	-1.49	32.986	26.56	0.578	6.47	78	1.79	29
175	-1.63	33.323	26.83	0.620	6.94	84	1.46	29
195	-1.33	33.630	27.07	0.584	6.54	79	1.52	30
210	-1.00	33.993	27.36	0.558	6.25	77	1.37	25
225	-0.74	34.244	27.55	0.546	6.12	76	1.16	21
240	-0.43	34.484	27.73	0.542	6.07	76	1.00	19
260	-0.24	34.590	27.81	0.536	6.00	76	0.99	18

STATION 17

Date: 8/13/59 Time: 2100
Latitude: 77°40' N Longitude: 164°00' W Depth: 268 m
Wind: 6 kts, Dir. 140° Weather: 02 Bar.: 1021
Temp.: Dry 00.6°, Wet 00.4° Cloud: 0, amt. 8

25	-1.52	31.033	24.98	0.838	9.39	111	0.51	4
50	-1.32	31.688	25.50	0.740	8.29	99	0.94	-
75	-1.66	31.912	25.69	0.708	7.93	94	1.07	18
100	-1.28	32.264	25.97	0.635	7.11	86	1.14	22
140	-1.50	32.845	26.44	0.591	6.62	80	1.37	33
160	-1.50	33.096	26.65	0.588	6.59	79	1.54	30
175	-1.48	33.289	26.80	0.590	6.61	80	1.46	30
190	-1.32	33.596	27.05	0.577	6.46	79	1.32	26
205	-1.06	33.904	27.29	0.560	6.27	77	1.14	25
220	-0.78	34.195	27.51	0.551	6.17	76	1.07	20
240	-0.44	34.495	27.74	0.540	6.05	76	0.90	19
260	-0.28	34.581	27.80	0.542	6.07	76	0.91	19

STATION 18

Date: 8/17/59 Time: 2100
Latitude: 77°50' N Longitude: 165°40' W Depth: 450 m
Wind: 7 kts, Dir. 110° Weather: 02 Bar.: 1025
Temp.: Dry -01.7, Wet -01.8 Cloud: 1, amt. 5

Depth	T	S	Sigma-T		O ₂		P	SI
m	°C	o/oo		µg A/l	ml/l	%	µg A/l	µg A/l
50	-1.20	31.744	25.55	0.722	8.09	97	0.84	5
75	-1.32	32.027	25.78	0.670	7.50	90	1.00	13
100	-1.36	32.441	26.11	0.630	7.06	85	1.35	24
150	-1.50	32.989	26.56	0.591	6.62	80	1.42	28
175	-1.51	33.291	26.81	0.604	6.76	82	1.40	28
200	-1.34	33.612	27.06	0.582	6.52	79	1.50	24
250	-0.40	34.504	27.75	0.542	6.07	76	1.05	12
275	-0.18	34.619	27.83	0.546	6.12	77	0.90	14
300	0.02	34.691	27.88	0.564	6.32	80	0.82	13
350	0.38	34.814	27.96	0.597	6.69	86	0.82	6
400	0.47	34.856	27.98	0.599	6.71	86	0.85	9
425	0.48	34.861	27.98	0.597	6.69	86	0.86	10

STATION 19

Date: 8/21/59 Time: 2100
Latitude: 77°50' N Longitude: 166°50' W Depth: 328 m
Wind: 6 kts, Dir. 20 Weather: - Bar.: 1025
Temp.: Dry -4.7°, Wet -4.9° Cloud: 0, amt. 7

20	-1.58	30.838	24.82	0.820	9.18	109	0.72	8
50	-1.68	31.740	25.55	0.794	8.89	106	0.83	9
75	-1.67	31.894	25.68	0.709	7.94	94	0.99	9
100	-1.42	32.219	25.94	0.640	7.17	86	1.24	-
150	-1.50	32.960	26.54	0.583	6.53	79	1.48	28
175	-1.46	33.356	26.86	0.584	6.54	79	1.47	24
200	-1.08	33.928	27.31	0.557	6.24	77	1.29	20
225	-0.50	34.419	27.68	0.541	6.06	76	1.06	19
250	-0.27	34.601	27.82	0.548	6.14	77	0.96	12
275	0.02	34.700	27.88	0.562	6.29	80	0.90	8
300	0.20	34.760	27.92	0.564	6.32	81	0.86	9
325	0.26	34.780	27.94	0.567	6.35	81	0.96	8

STATION 20

Date: 8/24/59 Time: 2100
Latitude: 77°50' N Longitude: 168°20' W Depth: 495 m
Wind: 5 kts, Dir. 100° Weather: 02 Bar.: 1019
Temp.: Dry -6.7°, Wet -6.8° Cloud: 0, amt. 6

50	-1.52	31.545	25.39	0.765	8.57	102	0.88	5
100	-1.36	32.320	26.02	0.636	7.12	86	1.39	16
150	-1.46	33.002	26.57	0.577	6.46	78	1.55	26
200	-1.02	33.996	27.36	0.556	6.23	77	1.37	21
300	0.22	34.758	27.92	0.574	6.43	82	0.81	10
375	0.48	34.856	27.98	0.578	6.70	86	0.84	8
425	0.50	34.865	27.99	0.596	6.68	86	0.86	12
475	0.48	34.876	28.00	0.602	6.74	87	0.86	14

STATION 21

Date: 8/27/59

Time: 2000

Latitude: 78°00' N

Longitude: 168°50' W

Depth: 470 m

Wind: 4 kts, Dir. 270°

Weather: 01

Bar.: 1010

Temp.: Dry -5.8°, Wet -6.0°

Cloud: 0, amt. 2

Depth	T	S	Sigma-T		O ₂		P	Si
m	°C	o/oo		µg A/l	ml/l	%	µg A/l	µg A/l
20	-1.66	30.509	24.56	0.818	9.16	108	0.72	4
50	-1.63	31.704	25.52	0.750	8.40	100	0.96	10
75	-1.64	31.941	25.71	0.684	7.66	91	1.05	22
100	-1.50	32.163	25.89	0.636	7.12	85	0.97	23
125	-1.38	32.664	26.29	0.593	6.64	80	1.44	27
150	-1.48	33.000	26.57	0.572	6.41	77	1.36	36
175	-1.42	33.404	26.89	0.579	6.48	78	1.14	47
185	-1.32	33.610	27.06	0.572	6.41	78	----	30
200	-0.98	34.018	27.38	0.560	6.27	77	1.41	21
220	-0.58	34.356	27.63	0.543	6.08	76	1.12	19
250	-0.25	34.576	27.80	0.546	6.12	77	1.08	14
275	-0.02	34.697	27.88	0.556	6.23	79	0.93	12
300	0.20	34.771	27.93	0.576	6.45	82	1.09	9
350	0.42	34.838	27.97	0.593	6.64	85	1.11	6
400	0.48	34.857	27.98	0.600	6.72	87	1.08	17
450	0.49	34.867	27.99	0.598	6.70	86	1.23	8

STATION 22

Date: 8/31/59

Time: 2100

Latitude: 78°00' N

Longitude: 169°30' W

Depth: 1510 m

Wind: 6 kts, Dir. 50°

Weather: 02

Bar.: 1014

Temp.: Dry -3.4°, Wet -3.5°

Cloud: 0, amt. 8

30	-1.60	31.217	25.13	0.804	9.00	107	0.81	2
60	-1.45	31.666	25.49	0.740	8.29	99	1.08	8
85	-1.48	31.951	25.72	0.694	7.77	93	1.31	8
120	-1.41	32.657	26.29	0.603	6.75	81	1.67	26
150	-1.52	33.099	26.65	0.594	6.65	80	1.84	26
180	-1.26	33.675	27.11	0.570	6.38	78	1.62	24
200	-0.88	34.143	27.47	0.551	6.17	76	1.38	36
250	-0.31	34.605	27.82	0.568	6.36	80	1.01	8
275	-0.26	34.619	27.83	0.578	6.47	82	1.11	13
300	0.22	34.762	27.92	0.582	6.52	83	0.93	8
350	0.48	34.836	27.97	0.608	6.81	88	1.09	7
400	0.55	34.867	27.99	0.609	6.82	88	1.09	7
500	0.48	34.888	28.01	0.609	6.82	88	1.15	8
600	0.31	34.890	28.02	0.614	6.88	88	1.06	4
700	0.17	34.895	28.03	0.620	6.94	89	1.10	11
800	0.02	34.901	28.05	0.629	7.04	90	1.02	3
900	-0.11	34.915	28.06	0.634	7.10	90	1.33	8
1000	-0.22	34.915	28.07	0.630	7.06	89	1.24	2
1100	-0.31	34.913	28.07	0.630	7.06	89	1.28	3
1200	-0.36	34.924	28.08	0.925	10.36	131	1.25	7
1300	-0.42	34.924	28.09	0.633	7.09	89	1.26	9
1400	-0.48	34.944	28.11	0.618	6.92	87	1.26	-
1500	-0.46	34.941	28.10	0.610	6.33	86	1.29	8

STATION 23 ¹⁵³

Date: 9/8/59

Time: 2200

Latitude: 77°40' N

Longitude: 172°00' W

Depth: 2230 m

Wind: 3 kts, Dir. 190°

Weather: 02

Bar.: 1026

Temp.: Dry -2.8°, Wet -2.8°

Cloud: 0, amt. 7

Depth m	T °C	S o/oo	Sigma-T	O ₂ µg A/1	O ₂ ml/l	%	P µg A/1	Si µg A/1
20	-1.67	30.491	24.54	0.810	9.07	107	0.90	2
50	-1.58	31.708	25.52	0.762	8.53	102	1.01	1
75	-1.58	31.957	25.73	0.680	7.62	91	1.40	8
100	-1.25	32.309	26.00	0.635	7.11	86	1.55	17
150	-1.46	33.139	26.68	0.554	6.20	75	1.84	27
175	-1.28	33.654	27.09	0.569	6.37	78	1.66	23
200	-0.98	34.182	27.51	0.554	6.20	76	1.27	16
250	-0.52	34.549	27.79	0.582	6.52	82	1.04	6
300	0.09	34.737	27.91	0.599	6.71	85	0.95	5
350	0.49	34.838	27.97	0.610	6.83	88	1.02	6
400	0.51	34.845	27.97	0.614	6.88	89	0.99	6
500	0.56	34.890	28.01	0.618	6.92	89	0.97	4
600	0.42	34.895	28.02	0.614	6.88	88	1.04	5
700	0.22	34.901	28.03	0.618	6.92	89	1.15	7
800	0.09	34.906	28.05	0.616	6.90	88	1.16	7
900	-0.08	34.912	28.06	0.630	7.06	90	1.12	9
1000	-0.15	34.913	28.06	0.626	7.01	89	1.01	8
1200	-0.30	34.928	28.08	0.613	6.87	87	1.13	8
1500	-0.43	34.941	28.10	0.604	6.76	85	1.02	12
1800	-0.47	34.957	28.12	0.595	6.66	84	1.06	8
2000	-0.46	34.960	28.12	0.580	6.50	82	1.08	28
2100	-0.42	34.968	28.12	0.578	6.47	82	1.04	29

STATION 24

Date: 9/14/59

Time: 2100

Latitude: 78°00' N

Longitude: 170°20' W

Depth: 2194 m

Wind: 00 kts, Dir. 00°

Weather: 73

Bar.: 1015

Temp.: Dry -1.1°, Wet -1.1°

Cloud: X, amt. 9

20	-1.65	30.535	24.58	0.810	9.07	107	0.77	9
40	-1.60	31.412	25.29	0.745	8.34	99	0.88	11
61	-1.42	31.692	25.51	0.712	7.97	95	0.93	15
78	-1.02	31.926	25.69	0.670	7.50	91	1.00	16
92	-1.35	32.471	26.14	0.612	6.85	83	1.18	26
110	-1.44	32.621	26.26	0.600	6.72	81	1.38	24
150	-1.24	33.729	27.15	0.542	6.07	74	1.43	22
210	-1.12	34.303	27.61	0.593	6.64	82	0.76	15
250	-0.52	34.540	27.78	0.620	6.94	87	0.80	10
300	0.14	34.722	27.89	0.611	6.84	87	0.69	7
350	0.50	34.838	27.97	0.606	6.79	87	0.86	6
400	0.54	34.845	27.97	0.600	6.72	87	0.92	6
500	0.59	34.758	27.90	0.616	6.90	89	0.88	7
600	0.40	34.886	28.01	0.612	6.85	88	0.93	4
700	0.22	34.899	28.03	0.617	6.91	89	0.93	4
800	0.06	34.904	28.05	0.620	6.94	89	1.02	6
900	-0.06	34.906	28.05	0.621	6.96	88	0.99	6
1000	-0.16	34.910	28.06	0.621	6.96	88	0.93	5
1200	-0.32	34.919	28.08	0.618	6.92	87	1.11	8
1500	-0.46	34.937	28.10	0.606	6.79	85	0.99	8
1800	-0.48	34.962	28.12	0.590	6.61	83	1.09	11
2000	-0.48	34.966	28.12	0.591	6.62	83	1.03	13
2150	-0.41	34.960	28.11	0.585	6.55	83	1.43	11

STATION 25Date: 9/21/59Time: 2000Latitude: 78°00' NLongitude: 172°10' WDepth: 2230 mWind: 4 kts, Dir. 330°Weather: 01Bar.: 1028Temp.: Dry -3.4°, Wet -3.6°Cloud: 1 amt. 2

Depth m	T °C	S o/oo	Sigma-T	O ₂ µg A/l	O ₂ ml/l	%	P µg A/l	Si µg A/l
20	-1.70	30.605	24.63	0.816	9.14	108		
50	-1.38	31.722	25.53	0.703	7.87	94		
100	-1.40	32.590	26.23	0.595	6.66	80		
150	-1.50	33.273	26.79	0.571	6.40	77		
200	-1.14	34.209	27.64	0.564	6.32	77		
250	-0.70	34.502	27.76	0.598	6.70	83		
300	-0.09	34.672	27.87	0.593	6.64	84		
350	0.38	34.805	27.95	0.605	6.78	87		
400	0.52	34.839	27.97	0.610	6.83	88		
600	0.54	34.895	28.01	0.614	6.88	89		
800	0.16	34.901	28.04	0.610	6.83	87		
1000	-0.09	34.917	28.06	0.605	6.78	86		
1200	-0.27	34.919	28.07	0.614	6.88	87		
1500	-0.42	34.937	28.10	0.612	6.85	86		
2000	-0.45	34.959	28.12	0.582	6.52	82		
2000	-0.45	34.959	28.12	0.582	6.52	82		
2200	-0.41	34.962	28.10	0.574	6.43	80		

STATION 27Date: 10/11/59Time: 0138Latitude: 78°02' NLongitude: 174°50' WDepth: 1500 mWind: 9 kts, Dir. 52°Weather: 70Bar.: 1026Temp.: Dry -07.7°, Wet -07.8°Cloud: 0, amt. 9

300	-0.04	34.684	27.87
450	0.58	34.878	28.00
600	0.48	34.895	28.01
675	0.25	34.893	28.03
850	-0.21	34.969	28.11

STATION 28aDate: 10/28/59Time: 0048Latitude: 77°57' NLongitude: 170°49' WDepth: 2231 mWind: 11 kts, Dir. 280°Weather: 02Bar.: 1026Temp.: Dry -26.8°, Wet -26.8°Cloud: 0, amt. 9

20	-----	30.427	-----
50	-1.51	31.610	25.44
100	-1.30	32.380	26.06
150	-1.42	33.089	26.64
200	-1.18	34.052	27.41
300	-0.08	34.732	27.91

STATION 28bDate: 10/29/59Time: 0118Latitude: 77°54' NLongitude: 170°48' WDepth: 2231 mWind: 11 kts, Dir. 280°Weather: 02Bar.: 1026Temp.: Dry -26.8°, Wet -26.8°Cloud: 0, amt. 9

400	0.52	34.846	27.97
700	0.26	34.907	28.04
900	-0.04	34.907	28.05
1000	-0.20	34.912	28.07
1200	-0.32	34.920	28.08
1500	-0.47	34.930	28.09

STATION 29a

Date: 11/02/59 Time: 0420
Latitude: 77°37' N Longitude: 172°4' W Depth: 2240 m
Wind: 7 kts, Dir. 328° Weather: 02 Bar.: 1040
Temp.: Dry -28.9°, Wet -28.9° Cloud: 2, amt. 6

Depth m	T °C	S o/oo	Sigma-T
20	-1.67	30.063	24.19
50	-1.50	31.600	25.44
65	-1.46	31.620	25.45
100	-1.35	32.217	25.93
125	-1.37	32.406	26.09
225	-0.92	34.117	27.46

STATION 29b

Date: 11/03/59 Time: 0215
Latitude: 77°32' N Longitude: 172°8' W Depth: 2240 m
Wind: 4 kts, Dir. 220° Weather: 02 Bar.: 1043
Temp.: Dry -27.8°, Wet -27.8° Cloud: 5, amt. 6

400	0.52	34.838	27.97
700	0.24	34.889	28.02
900	-0.04	34.898	28.05
1000	-0.14	34.905	28.06
1200	-0.32	34.912	28.07
1500	-0.44	34.941	28.10

STATION 30a

Date: 11/22/59 Time: 2108
Latitude: 77°52' N Longitude: 172°37' N Depth: 2231 m
Wind: 3 kts, Dir. 64° Weather: 02 Bar.: 1006
Temp.: Dry -30.7°, Wet -30.8° Cloud: 2, amt. 7

20	-1.68	30.333	24.41
50	-1.52	31.642	25.47
80	-1.45	32.054	25.80
130	-1.44	32.833	26.43
200	-1.11	34.106	27.45
300	-0.06	34.684	27.87

STATION 30b

Date: 11/23/59 Time: 0219
Latitude: 77°52' N Longitude: 172°37' W Depth: 2231 m
Wind: 3 kts, Dir. 64° Weather: 02 Bar.: 1006
Temp.: Dry -30.7°, Wet -30.8° Cloud: 2, amt. 7

400	0.51	34.840	27.97
800	0.10	34.895	28.04
1000	-0.15	34.907	28.06
1300	-0.36	34.922	28.08
1500	-0.46	34.932	28.09
1700	-0.48	34.943	28.10

STATION 31aDate: 12/4/59Time: 0200Latitude: 77°43' NLongitude: 172°49' WDepth: 2264 mWind: 7 kts, Dir. 09°Weather: 37Bar.: 1030Temp.: Dry -32.7°, Wet -32.7°Cloud: X, amt. 9

Depth	T °C	S o/oo	Sigma-T
20	-1.66	30.095	24.22
50	-1.56	31.496	25.35
80	-1.51	31.923	25.70
130	-1.40	32.731	26.35
200	-1.00	34.048	27.40
300	-0.08	34.679	27.87

STATION 31bDate: 12/1/59Time: 0800Latitude: 77°42' NLongitude: 172°52' WDepth: 2264 mWind: 8 kts, Dir. 04°Weather: 37Bar.: 1030Temp.: Dry -32.8°, Wet -32.9°Cloud: X, amt. 9

400	0.49	34.937	27.97
600	0.40	34.890	28.02
900	-0.07	34.905	28.05
1200	-0.34	34.919	28.08
1500	-0.46	34.936	28.10
1800	-0.48	34.945	28.11

STATION 32aDate: 12/4/59Time: 2320Latitude: 77°21' NLongitude: 172°21' WDepth: 2085 mWind: 18 kts, Dir. 268°Weather: 37Bar.: 1006Temp.: Dry -19.5°, Wet -19.6°Cloud: X, amt. 9

0	-1.64	29.788	23.97
20	-1.63	29.784	23.97
30	-1.64	29.801	23.98
50	-1.32	31.483	25.34
80	-1.44	31.958	25.72
100	-1.33	32.294	25.99

STATION 32bDate: 12/5/59Time: 0230Latitude: 77°21' NLongitude: 172°21' WDepth: 2235 mWind: 18 kts, Dir. 268°Weather: 37Bar.: 1006Temp.: Dry -19.5°, Wet -19.6°Cloud: X, amt. 9

150	-1.48	32.955	26.53
250	-0.36	34.566	27.79
300	-0.10	34.738	27.91
350	0.50	34.830	27.96
450	0.52	34.876	28.00
700	0.16	34.891	28.03

STATION 33a

Date: 12/6/59 Time: 0353
Latitude: 77°11' N Longitude: 171°58' W Depth: 2200 m
Wind: 22 kts, Dir. 266° Weather: 37 Bar.: 989
Temp.: Dry -14.4°, Wet -14.5° Cloud: X, amt. 9

Depth	T °C	S o/oo	Sigma-T
10	-1.64	29.744	23.94
30	-1.64	-----	-----
70	-1.36	31.749	25.55
90	-1.38	32.124	25.86
100	-1.38	32.325	26.02
125	-1.44	-----	-----
130	-1.51	32.719	26.34

STATION 33b

Date: 12/7/59 Time: 0705
Latitude: 77°20' N Longitude: 171°55' W Depth: 2200 m
Wind: 12 kts, Dir. 313° Weather: 37 Bar.: 1012
Temp.: Dry -31.7°, Wet -31.8° Cloud: X, amt. 9

150	-1.44	32.943	26.52
250	-0.29	34.596	27.82
350	-----	34.704	-----
700	0.39	34.886	28.01
1100	-0.30	34.914	28.07
1400	-0.44	34.925	28.09

STATION 34a

Date: 12/8/59 Time: 2340
Latitude: 77°21' N Longitude: 171°36' W Depth: 2250 m
Wind: 20 kts, Dir. 268° Weather: 37 Bar.: 1002
Temp.: Dry -22.8°, Wet -22.8° Cloud: X, amt. 9

300	0.24	34.765	27.92
400	0.42	34.852	27.98
700	0.19	34.898	28.03
1100	-0.23	34.920	28.07
1400	-0.44	34.932	28.09
1700	-0.48	34.945	28.11

STATION 34b

Date: 12/9/59 Time: 0320
Latitude: 76°59' N Longitude: 171°26' W Depth: 2250 m
Wind: 20 kts, Dir. 268° Weather: 37 Bar.: 1002
Temp.: Dry -22.8°, Wet -22.8° Cloud: X, amt. 9

10	-1.66	29.665	23.87
20	-1.64	29.670	23.88
50	-1.42	31.377	25.25
100	-1.38	32.365	26.05
150	-1.44	33.009	26.58
250	-0.28	34.605	27.82

STATION 35aDate: 12/16/59Time: 0100Latitude: 76°59' NLongitude: 169°49' WDepth: 2185 mWind: 12 kts, Dir. 215°Weather: 37Bar.: 1012Temp.: Dry -25.1°, Wet -25.2°Cloud: X, amt. 9

Depth	T °C	S o/oo	Sigma-T
10	-1.70	29.736	23.93
20	-1.64	29.733	23.93
30	-1.66	29.738	23.93
80	-1.40	32.018	25.77
120	-1.53	32.628	26.27
150	-1.47	33.016	26.58

STATION 35bDate: 12/16/59Time: 2135Latitude: 77°1' NLongitude: 169°30' WDepth: 2185 mWind: 7 kts, Dir. 173°Weather: 37Bar.: 1012Temp.: Dry -34.3°, Wet -34.4°Cloud: X, amt. 9

200	-0.81	34.040	27.39
350	0.46	34.834	27.97
500	0.52	34.881	28.00
900	-0.09	34.897	28.05
1300	-0.39	34.992	28.14
1800	-0.48	34.997	28.11

STATION 36Date: 12/21/59Time: 0900Latitude: 77°10' NLongitude: 168°22' WDepth: 549 mWind: 7 kts, Dir. 173°Weather: 37Bar.: 1006Temp.: Dry -25.1°, Wet -25.2°Cloud: X, amt. 9

150	-1.48	33.007	26.57
250	-0.32	34.560	27.79
300	0.19	34.747	27.91
350	0.42	34.815	27.95
425	0.48	34.861	27.99
500	0.40	34.875	28.00

STATION 37aDate: 12/31/59Time: 2122Latitude: 77°15' NLongitude: 167°26' WDepth: 519 mWind: 13 kts, Dir. 233°Weather: 37Bar.: 1040Temp.: Dry -31.2°, Wet -31.3°Cloud: 1, amt. 2

250	-0.30	34.567	27.79
300	0.14	34.735	27.91
350	0.40	34.813	27.95
400	0.50	34.847	27.98
450	0.48	34.866	27.99

STATION 37bDate: 1/1/60Time: 0205Latitude: 77°14' NLongitude: 167°23' WDepth: 519 mWind: 13 kts, Dir. 233°Weather: 37Bar.: 1040Temp.: Dry -31.2°, Wet -31.3°Cloud: 1, amt. 2

10	-1.66	29.637	23.85
20	-1.65	29.997	24.14
30	-1.67	30.007	24.15
80	-1.26	32.090	25.83
120	-1.44	32.654	26.29
150	-1.50	33.009	26.58

5. GRAVITY

At Station ALPHA and Fletcher's Ice Island, T-3 (BRAVO), relative changes in the acceleration of gravity were measured with gravimeters. Station CHARLIE was abandoned before a meter designed especially for use on floating ice could be delivered. Drift rates were determined and absolute values were derived from ties to pendulum and gravimeter nets in Alaska and Greenland.

The instruments were stored and read in the laboratory buildings to reduce temperature and motion effects to a minimum. Generally they were placed on the building floors for readings; however at various times platforms mounted on timbered piers frozen into the ice provided more stable bases and reduced or eliminated wind-induced high-frequency vibrations. The beams of the gravimeters normally oscillated about the null points with a mean period of approximately 20 sec in response to small vertical motions of the ice. Therefore the usual reading procedure was to note the beam position (in terms of optical scale divisions) at 3- or 5-sec intervals for periods of 5 or 6 min and average the results to correct dial readings to null positions. Dial to cross-hair division ratios were frequently determined to permit the corrections. Occasionally, however, the amplitude of the beam motion was sufficiently great to cause the beam to strike the stops, thus making accurate readings impossible.

Geographical positions have been interpolated between celestial fixes. Comments pertaining to the accuracy of such positions have been made in previous sections.

In addition to the gravity values tabulated in this report, several others were obtained by scientists from the University of Wisconsin and are quoted below (Woolard, ²⁴ 1960, Table III-A-7.6). All elevations and the geographical coordinates in parentheses have been inserted by this writer.

ALPHA

<u>DATE</u>	<u>POSITION</u>	<u>ELEVATION (ft)</u>	<u>OBSERVED GRAVITY (gals)</u>
23 April 1957	-	6	983.0900
13 Nov. 1957	(84° 15'N 167° 40'W)	6	983.1692
27 April 1958	84° 02'N 152° 24'W	6	983.1823
14 May 1958	83° 45'N 152° 10'W	6	983.1669

T-3

17 April 1957	(82° 50'N 96° 20'W)	22	983.1609
26 Sept. 1958	78° 28'N 122° 12'W	28	983.0087

5.1 Alpha Gravity

The gravity program at Drifting Station ALPHA was conducted by the Lamont Geological Observatory from 23 May 1957 to 2 November 1958, when the station was abandoned. The following commentary is essentially verbatim from that submitted with the results:

Two gravimeters were used:

- | | |
|--------------|--|
| Frost C-39 | (scale constant 0.0957 milligal/scale division)
From 23 May 1957, to 27 April 1958. |
| Frost C-1-15 | (scale constant 0.0927 milligal/scale division)
From 27 April to 2 November 1958. |

Gravity Base Value: taken as 982.2450 gals at the Fairbanks pendulum station.

The elevation of the instrument about sea level was not given; an elevation of 2 m was assumed in the reduction. (Free air anomalies were determined according to the International Gravity Formula. ED)

The value of this data has been greatly reduced by lack of important information. Factors affecting the results will be considered for each period as follows:

- | | |
|-------------------------------------|--|
| 1957 - 23 May to
8 June | There was no navigation during this period. The positions of the readings are unknown and no free air anomalies can be given. |
| - 9 June to
7 Sept. | The vector was reset on 7 August 1957. No ties were made. The vector stopped functioning and was removed from the station on 7 September 1957. No ties were made to the base station after 23 May 1957. The observed values between 7 August and 7 September can therefore not be used and no drift correction can be computed for this period.

The path of the station between 7 August and 7 September was covered very closely later in 1957; so there is no reason to try to use data from this period. |
| 1957 - 14 Nov.to
1958 - 27 April | The gravity value at the beginning and the end of this period was obtained. The drift correction was small: + 1.4 milligal for the period.

One assumption was made: that an instrument fall between 12 and 13 February 1958, caused an obvious tare, requiring a correction of minus 69 scale divisions. |
| 1958 - 27 April to
2 Nov | No information on ties after 27 April was available and consequently no drift correction could be made for the Frost gravimeter C-1-15, which was used this period.

Between 16 and 19 May the instrument was moved to a new camp site without ties. No correction has been applied. |

DATE (1957)	LATITUDE (NORTH)	LONGITUDE (WEST)	OBSERVED GRAVITY (GALS)	FREE AIR ANOMALIES (MGALS)
23 MAY			983.0907	
30 JUN	81 38	164 34	983.1105	- 0.2
5 JUL	81 59.6	164 49	983.1229	+ 3.0
8	82 20.0	165 35	983.1279	- 0.3
12	82 31.7	165 59	983.1425	+ 9.7
16	82 44.6	165 40.5	983.1578	+ 20.0
18	82 58	166 25	983.1566	+ 13.8
22	82 48	166 51	983.1463	+ 7.2
22	82 43.7	166 45	983.1415	+ 4.0
23	82 45	166 38	983.1414	+ 3.4
24	82 47	166 49	983.1427	+ 4.0
25	82 53.5	167 19	983.1499	+ 8.8
25	82 54.6	167 23	983.1506	+ 9.0
26	82 54.6	167 33	983.1540	+ 12.4
26	82 52	167 43	983.1572	+ 16.6
27	82 51.2	167 40	983.1597	+ 19.4
28	82 55.4	167 20	983.1653	+ 23.5
30	83 04.1	167 17	983.1624	+ 17.4
30	83 06	167 14	983.1595	+ 13.8
30	83 06	167 14	983.1597	+ 14.0
31	83 10	167 28	983.1581	+ 10.6
31	83 14	167 33	983.1572	+ 8.6
1 AUG	83 13.7	167 10	983.1570	+ 8.5
1	83 12.4	166 54	983.1583	+ 10.3
2	83 15.8	166 35	983.1574	+ 8.2
2	83 19.0	166 20	983.1549	+ 4.6
3	83 23.5	166 17	983.1549	+ 3.0
4	83 37.0	166 26	983.1539	- 2.6
5	83 38.3	166 24	983.1554	- 1.5
5	83 39.7	166 22	983.1539	- 3.5
6	83 49.0	166 55	983.1731	+ 12.7
14 NOV	84 16.0	167 33	983.1699	+ 1.1
15	84 17.8	167 12	983.1718	+ 2.4
16	84 19.4	166 32	983.1820	+ 12.1
16	84 20.6	166 12	983.1869	+ 16.7
18	84 24.6	165 59	983.1893	+ 17.9
19	84 20.5	165 40	983.1904	+ 20.2
19	84 20.5	165 40	983.1912	+ 21.0
20	84 13.7	165 25	983.1903	+ 22.1
20	84 13.7	165 25	983.1902	+ 22.0
21	84 07.0	165 21	983.2065	+ 40.4
22	84 00.4	165 21.5	983.2122	+ 48.1
23	83 54.5	165 26	983.1714	+ 9.2
24	83 49.7	165 31	983.1507	- 10.0
24	83 49.7	165 31	983.1502	- 10.5
25	83 47.8	165 41	983.0962?	- 63.5?
26			983.0962?	- 63.3?
3 DEC	83 41.2	164 35	983.1576	- 0.3
3	83 41.0	164 12	983.1597	+ 1.9
5	83 39.8	164 08	983.1603	+ 2.9
5	83 39.0	164 20	983.1598	+ 2.6
6	83 38.0	164 32	983.1601	+ 3.3
7	83 39.4	164 50	983.1568	- 0.5
8	83 43.4	164 45	983.1535	- 5.1
9	83 46.1	164 39	983.1566	- 2.1
10	83 47.5	164 48	983.0974?	- 62.5?
11	83 47.7	164 58	983.0974?	- 62.6?
13	83 48.9	165 06	983.0974?	- 63.0?
15	83 46.5	164 50	983.0955?	- 64.1?
15	83 44.7	164 32	983.0965?	- 62.5?
16	83 39.0	163 50	983.1609	+ 3.7
17	83 34.5	163 20	983.1704	+ 14.8
18	83 31.6	163 02	983.1776	+ 22.9

DATE (1957)	LATITUDE (NORTH)	LONGITUDE (WEST)	OBSERVED GRAVITY (GALS)	FREE AIR ANOMALIES (MGALS)
19 DEC	83 31.8	162 53	983.1791	+ 24.4
20	83 33.1	162 32	983.1794	+ 24.2
21	83 34.4	162 08	983.1788	+ 23.2
22	83 34.4	162 08	983.1889	+ 32.7
23	83 38.0	161 45	983.1883	+ 31.5
24	83 38.6	161 40	983.1802	+ 23.2
25	83 38.4	161 36	983.1801	+ 23.1
26	83 37.6	161 40	983.1801	+ 23.4
27	83 37.7	161 40	983.1800	+ 23.3
28	83 38.0	161 35	983.1818	+ 25.0
29	83 37.6	161 40	983.1799	+ 23.2
30	83 37	161 45	983.1807	+ 24.2
31	83 36.8	161 45	983.1825	+ 26.1
(1958)				
1 JAN	83 37.5	161 39	983.1822	+ 25.6
2	83 38.9	161 29	983.1778	+ 20.7
3	83 39.8	161 23	983.1760	+ 18.6
4	83 41.0	161 05	983.1731	+ 15.3
5	83 44.1	160 36	983.1727	+ 13.9
6	83 44.5	160 36	983.1739	+ 14.9
7	83 44.8	160 25	983.1735	+ 14.4
8	83 41.1	160 19	983.1752	+ 17.4
9	83 35.0	159 27	983.1748	+ 19.0
10	83 26.0	158 56	983.1610	+ 8.2
11	83 15.0	159 00	980.1580	+ 9.1
12	83 16.4	159 13	983.1709	+ 21.5
13	83 13.3	159 12	983.1681	+ 19.8
14	83 12.9	158 54	983.1648	+ 16.6
15	83 14.3	158 15	983.1026 ?	- 46.1 ?
16	83 21.3	157 17	983.1026 ?	- 48.5 ?
17	83 26.0	156 38	983.1662	- 13.4
18	83 28.5	156 43	983.1672	+ 13.6
19	83 31.0	156 50	983.1682	+ 13.7
20	83 30.5	157 00	983.1683	+ 14.0
21	83 28.6	157 05	983.1683	+ 14.6
22	83 27.0	157 38	983.1676	+ 14.5
23	83 24.0	158 03	983.1629	+ 10.8
24	83 22.4	158 27	983.1557	+ 4.2
25	83 23.8	158 22	983.1607	+ 8.7
26	83 25.0	158 22	983.1607	+ 8.3
27	83 25.0	158 29	983.1623	+ 9.9
28	83 24.8	158 15	983.1640	+ 11.7
29	83 26.2	157 54	983.1641	+ 11.3
30	83 26.0	157 27	983.1620	+ 9.2
31	83 26.3	156 48	983.1647	+ 11.8
1 FEB	83 26.4	156 33	983.1641	+ 11.2
2	83 27.5	156 22	983.1661	+ 12.8
3	83 29.5	156 26	983.1671	+ 13.2
4	83 32.0	156 36	983.1679	+ 13.1
5	83 40.0	157 40	983.1771	+ 19.6
6	83 43.2	157 43	983.1995	+ 41.0
7	83 42.8	157 40	983.1939	+ 35.5
8	83 43.5	157 32	983.1979	+ 39.3
9	83 45.6	157 29	983.2021	+ 42.8
10	83 45.6	157 15	983.2045	+ 45.2
11	83 44.7	156 42	983.2027	+ 43.7
12	83 44.2	156 05	983.1960	+ 37.1
13	83 45.7	155 27	983.1960	+ 36.6
14	83 45.2	155 10	983.1954	+ 36.2
15	83 44.3	155 15	983.1968	+ 37.9
16	83 44.0	155 07	983.1970	+ 38.2

DATE (1958)	LATITUDE (NORTH)	LONGITUDE (WEST)	OBSERVED GRAVITY (GALS)	FREE AIR ANOMALIES (MGALS)
17 FEB	83 45.0	155 06	983.1981	+ 39.0
18	83 45.5	155 05	983.1981	+ 38.8
19	83 45.5	155 02	983.1988	+ 39.5
20	83 45.4	154 59	983.1988	+ 39.6
21	83 46.0	155 05	983.1986	+ 39.2
22	83 46.1	155 14	983.1987	+ 39.2
23	83 45.6	155 10	983.1988	+ 39.5
24	83 43.5	154 59	983.1990	+ 40.4
25	83 42.5	154 42	983.1989	+ 40.6
26	83 41.6	154 24	983.1933	+ 35.3
27	83 41.2	154 14	983.1891	+ 31.2
28	83 40.7	154 04	983.1817	+ 24.0
1 MAR	83 37.4	154 10	983.1722	+ 15.6
2	83 31.8	154 15	983.1620	+ 7.3
3	83 30.0	154 16	983.1570	+ 2.9
4	83 30.6	154 29	983.1576	+ 3.3
5	83 33.3	154 27	983.1623	+ 7.1
6	83 34.3	154 13	983.1638	+ 8.2
7	83 36.1	154 08	983.1648	+ 8.6
8	83 38.0	154 03	983.1658	+ 9.0
9	83 40.5	154 14	983.1732	+ 15.6
10	83 44.5	153 58	983.1821	+ 23.1
11	83 44.5	153 58	983.1796	+ 20.6
12	83 45.0	153 51	983.1809	+ 21.8
13	83 45.4	154 05	983.1844	+ 25.1
14	83 45.0	153 57	983.1794	+ 20.3
15	83 43.1	153 53	983.1716	+ 13.1
16	83 40.5	153 55	983.1737	+ 16.1
17	83 38.1	153 58	983.1689	+ 12.0
18	83 36.3	153 44	983.1574	+ 1.2
19	83 35.1	153 37	983.1553	- 0.5
20	83 41.2	153 30	983.1633	+ 5.4
21	83 47.2	153 22	983.1687	+ 8.9
23	83 50.2	153 33	983.1879	+ 27.1
24	83 48.5	153 48	983.1847	+ 24.4
25	83 46.3	153 44	983.1601	+ 10.5
26	83 46.5	153 11	983.1741	+ 14.5
27	83 48.2	152 49	983.1765	+ 16.3
29	83 48.5	152 20	983.1705	+ 10.2
31	83 47.7	152 38	983.1733	+ 13.3
4 APR	83 47.6	152 21	983.1739	+ 14.0
9	83 45.3	151 58	983.1640	+ 4.8
10	83 45.8	151 48	983.1615	+ 2.1
11	83 47.8	151 45	983.1639	+ 3.9
15	83 52.4	151 55	983.1701	+ 8.6
16	83 52.4	151 55	983.1701	+ 8.6
19	83 53.1	151 58	983.1705	+ 8.7
21	83 56.7	151 58	983.1714	+ 8.5
22	83 57.9	152 00	983.1738	+ 10.5
24	83 57.5	151 53	983.1719	+ 8.7
27	83 59.8	152 31	983.1830	+ 19.1
28	84 00.7	152 31	983.1784	+ 14.2
30	83 58.2	152 34	983.1830	+ 19.6
2 MAY	83 53.0	152 42	983.1838	+ 22.1
3	83 42	153 20	983.1613	+ 3.2
4	83 40.7	153 10	983.1589	+ 1.2
4	83 39.5	153 02	983.1589	+ 1.6
5	83 40.0	153 03	983.1598	+ 2.3
5	83 43.5	153 13	983.1643	+ 5.7
6	83 46.0	153 24	983.1707	+ 11.3
7	83 45.6	153 28	983.1722	+ 12.9
7	83 45.6	153 41	983.1723	+ 13.0
8	83 46.2	153 39	983.1718	+ 12.3

DATE (1958)	LATITUDE (NORTH)	LONGITUDE (WEST)	OBSERVED GRAVITY (GALS)	FREE AIR ANOMALIES (MGALS)
8 MAY	83 46.9	153 38	983.1726	
9	83 46.4	153 42	983.1741	+ 12.9
9	83 45.8	153 47	983.1749	+ 14.5
10	83 45.2	153 39	983.1727	+ 15.5
12	83 43.6	153 09	983.1627	+ 13.5
12	83 43.4	152 57	983.1626	+ 4.0
13	83 43.6	152 50	983.1618	+ 4.0
13	83 43.9	152 44	983.1620	+ 3.1
14	83 44.7	152 29	983.1605	+ 3.2
14	83 45.2	152 14	983.1608	+ 1.5
15	83 45.6	152 16	983.1631	+ 1.6
16	83 47.0	152 32	983.1700	+ 3.8
19	83 49.5	151 58	983.1774	+ 10.2
19	83 49.4	152 01	983.1772	+ 16.8
20	83 49.4	151 19	983.1735	+ 16.6
21	83 49.4	151 28	983.1735	+ 12.9
21	83 49.4	151 38	983.1737	+ 12.9
22	83 50.3	151 33	983.1754	+ 13.1
22	83 51.3	151 28	983.1780	+ 14.6
23	83 53.5	151 30	983.1797	+ 16.8
23	83 55.6	151 32	983.1885	+ 17.8
24	83 55.6	151 33	983.1819	+ 26.0
24	83 55.7	151 34	983.1821	+ 19.4
26	83 55.5	151 31	983.1822	+ 19.5
26	83 55.0	151 28	983.1825	+ 19.7
27	83 55.4	151 22	983.1823	+ 20.1
27	83 55.9	151 12	983.1834	+ 19.8
28	83 56.1	151 18	983.1834	+ 20.8
28	83 56.3	151 24	983.1834	+ 20.7
29	83 56.5	151 30	983.1830	+ 20.6
30	83 57.2	151 51	983.1835	+ 20.2
30	83 57.8	152 06	983.1838	+ 20.5
31	83 56.7	151 50	983.1835	+ 20.6
31	83 55.6	151 33	983.1833	+ 20.6
1 JUN	83 54.8	151 24	983.1839	+ 20.8
1	83 54.0	151 14	983.1833	+ 21.6
2	83 54.3	151 12	983.1833	+ 21.3
2	83 54.6	151 10	983.1833	+ 21.2
3	83 56.0	151 17	983.1835	+ 21.1
3	83 57.4	151 27	983.1837	+ 20.8
4	83 55.8	151 45	983.1836	+ 20.6
4	83 55.6	151 52	983.1840	+ 21.0
5	83 55.5	151 56	983.1841	+ 21.5
5	83 58.4	151 30	983.1839	+ 21.6
6	84 00.0	151 25	983.1843	+ 20.5
6	84 01.5	151 20	983.1864	+ 20.4
7	84 05.0	151 01	983.1873	+ 22.0
7	84 08.5	150 43	983.1899	+ 21.8
8	84 08.8	150 33	983.1957	+ 23.3
8	84 09.2	150 23	983.2013	+ 29.0
9	84 09.4	150 03	983.2088	+ 34.5
9	84 09.6	149 47	983.2161	+ 41.9
10	84 10.5	149 37	983.2210	+ 49.2
10	84 11.5	149 27	983.2261	+ 53.8
11	84 12.6	149 23	983.2288	+ 58.6
11	84 13.8	149 20	983.2320	+ 61.0
12	84 15.1	149 15	983.2340	+ 63.8
12	84 16.3	149 11	983.2346	+ 65.4
13	84 17.4	149 06	983.2337	+ 65.7
13	84 18.5	149 01	983.2337	+ 64.4
14	84 19.8	148 58	983.2351	+ 64.1
14	84 22.6	148 51	983.2397	+ 65.1
15	84 22.8	148 44	983.2434	+ 68.9
				+ 72.5

DATE (1958)	LATITUDE (NORTH)	LONGITUDE (WEST)	OBSERVED GRAVITY (GALS)	FREE AIR ANOMALIES (MGALS)
15 JUN	84 23.1	148 37	983.2459	+ 74.9
15	84 23.1	148 37	983.2459	+ 74.8
16	84 25.1	148 33	983.2465	+ 75.0
16	84 27.1	148 28	983.2460	+ 73.9
17	84 29.5	148 14	983.2430	+ 70.2
17	84 30.9	147 59	983.2407	+ 67.5
18	84 32.1	147 51	983.2354	+ 61.8
18	84 33.2	147 42	983.2334	+ 59.5
19	84 33.2	147 55	983.2332	+ 59.3
19	84 33.2	148 07	983.2326	+ 58.7
20	84 32.8	147 53	983.2328	+ 59.0
20	84 33.0	147 46	983.2323	+ 58.5
21	84 32.6	147 42	983.2326	+ 59.0
22	84 34.7	147 37	983.2323	+ 58.0
22	84 63.5	147 35	983.2311	+ 56.3
23	84 36.9	147 34	983.2316	+ 56.7
23	84 37.5	147 34	983.2328	+ 57.7
24	84 38.4	147 33	983.2329	+ 57.5
24	84 38.8	147 37	983.2326	+ 57.1
25	84 38.2	147 36	983.2325	+ 57.2
25	84 37.1	147 34	983.2322	+ 57.2
26	84 35.8	147 42	983.2319	+ 57.3
26	84 34.6	147 49	983.2314	+ 57.1
27	84 34.0	147 48	983.2313	+ 57.2
27	84 33.0	147 47	983.2307	+ 56.9
28	84 34.0	147 46	983.2296	+ 55.5
28	84 35.0	147 45	983.2296	+ 55.2
29	84 37.3	147 44	983.2301	+ 55.0
30	84 39.1	147 48	983.2333	+ 57.7
30	84 41.0	147 51	983.2337	+ 57.6
1 JUL	84 41.3	147 43	983.2335	+ 57.3
1	84 41.4	147 35	983.2324	+ 56.2
2	84 41.2	147 28	983.2321	+ 56.0
2	84 41.0	147 24	983.2315	+ 55.4
3	84 41.0	147 20	983.2307	+ 54.6
3	84 41.0	147 09	983.2289	+ 52.8
4	84 41.6	147 12	983.2285	+ 52.3
4	84 40.1	147 15	983.2290	+ 52.9
5	84 38.8	147 04	983.2299	+ 54.4
5	84 37.6	146 54	983.2254	+ 50.3
6	84 36.5	146 50	983.2225	+ 47.7
7	84 34.0	146 30	983.2170	+ 42.9
7	84 33.5	146 25	983.2133	+ 39.3
8	84 32.2	146 10	983.2098	+ 36.2
8	84 31.6	146 00	983.2068	+ 33.4
9	84 32.0	145 40	983.2062	+ 32.6
9	84 31.6	145 10	983.2045	+ 31.1
10	84 30.9	144 47	983.2046	+ 31.3
10	84 31.0	144 28	983.2117	+ 38.4
11	84 31.2	144 06	983.2133	+ 40.0
11	84 31.4	143 44	983.2116	+ 38.2
12	84 31.7	143 22	983.2103	+ 36.8
12	84 31.9	142 59	983.2111	+ 37.6
13	84 31.8	142 36	983.2115	+ 38.0
13	84 32.0	142 34	983.2110	+ 37.4
14	84 32.4	142 32	983.2116	+ 37.9
14	84 33.4	142 25	983.2099	+ 35.9
15	84 32.5	142 26	983.2100	+ 36.3
15	84 31.5	142 28	983.2108	+ 37.4
16	84 32.2	143 46	983.2094	+ 35.8
16	84 32.9	144 03	983.2096	+ 35.8
17	84 32.8	143 57	983.2098	+ 36.0
17	84 32.7	143 51	983.2112	+ 37.5

DATE (1958)	LATITUDE (NORTH)	LONGITUDE (WEST)	OBSERVED GRAVITY (GALS)	FREE AIR ANOMALIES (MGALS)
18 JUL	84 32.6	143 45	983.2108	+ 37.1
18	84 32.8	143 33	983.2120	+ 38.2
19	84 33.5	143 30	983.2126	+ 38.6
19	84 34.2	143 27	983.2124	+ 38.2
20	84 34.9	143 24	983.2126	+ 38.2
20	84 35.5	143 21	983.2108	+ 36.2
21	84 36.0	142 48	983.2106	+ 35.9
21	84 37.1	142 14	983.2079	+ 32.9
22	84 38.3	141 40	983.2050	+ 29.7
22	84 39.4	141 05	983.2077	+ 32.0
23	84 40.5	140 30	983.2133	+ 37.3
23	84 42.5	140 15	983.2229	+ 46.4
24	84 44.5	140 08	983.2250	+ 47.9
24	84 46.5	140 03	983.2252	+ 47.6
25	84 48.2	140 04	983.2222	+ 44.1
26	84 49.2	139 55	983.2218	+ 43.4
26	84 50.2	139 46	983.2224	+ 43.8
27	84 51.2	139 37	983.2222	+ 43.3
27	84 52.3	139 28	983.2225	+ 43.3
28	84 53.3	139 19	983.2236	+ 44.1
28	84 54.3	139 10	983.2258	+ 46.1
29	84 55.4	138 00	983.2299	+ 49.9
29	84 56.4	137 50	983.2335	+ 53.2
30	84 57.4	137 40	983.2395	+ 58.9
30	84 58.4	137 30	983.2429	+ 62.1
31	84 59.5	137 20	983.2419	+ 60.8
1 AUG	85 00.5	137 10	983.2418	+ 60.4
1	85 01.5	138 00	983.2413	+ 59.7
1	85 01.3	137 50	983.2409	+ 59.3
2	85 01.2	137 41	983.2399	+ 58.3
2	85 01.7	137 55	983.2402	+ 58.5
3	85 02.2	138 05	983.2402	+ 58.4
4	85 03.2	138 30	983.2324	+ 50.3
5	85 03.5	138 51	983.2246	+ 42.3
5	85 03.0	138 54	983.2235	+ 41.5
6	85 02.4	138 56	983.2232	+ 41.3
7	85 02.0	138 38	983.2288	+ 47.0
8	85 01.0	137 50	983.2403	+ 58.8
9	85 00.5	137 15	983.2297	+ 48.4
9	84 59.8	136 45	983.2248	+ 43.6
10	84 59.4	136 35	983.2229	+ 41.8
10	84 58.0	136 05	983.2207	+ 40.0
11	84 59.0	136 03	983.2207	+ 39.7
11	85 00.5	136 10	983.2213	+ 40.0
12	85 02.0	136 30	983.2209	+ 39.1
12	85 04.5	136 38	983.2209	+ 38.5
13	85 07.5	136 42	983.2223	+ 39.1
13	85 08.0	136 40	983.2232	+ 39.9
14	85 08.0	136 25	983.2251	+ 41.8
14	85 06.0	136 10	983.2250	+ 42.2
15	85 07.5	136 15	983.2259	+ 42.7
15	85 08.5	136 10	983.2278	+ 44.4
16	85 07.5	135 40	983.2291	+ 45.9
17	85 05.2	135 17	983.2317	+ 49.1
18	85 03.0	135 04	983.2306	+ 48.6
19	85 02.0	134 25	983.2315	+ 49.7
20	85 01.5	134 00	983.2320	+ 50.4
20	85 00.3	133 54	983.2353	+ 53.3
21	84 59.7	133 40	983.2367	+ 55.5
21	84 58.7	133 30	983.2379	+ 57.2
22	84 59.4	133 10	983.2392	+ 58.1
22	85 00.1	132 48	983.2401	+ 58.8
23	85 01.0	132 26	983.2404	+ 58.9

DATE (1958)	LATITUDE (NORTH)	LONGITUDE (WEST)	OBSERVED GRAVITY (GALS)	FREE AIR ANOMALIES (MGALS)
23 AUG	85 01.8	132 05	983.2402	+ 58.5
24	85 02.5	131 43	983.2415	+ 59.6
25	85 03.2	131 22	983.2428	+ 60.7
25	85 04.0	131 01	983.2450	+ 62.7
26	85 04.8	130 40	983.2439	+ 61.4
26	85 05.4	130 23	983.2416	+ 59.0
27	85 05.6	130 10	983.2394	+ 56.7
27	85 05.6	130 04	983.2365	+ 53.8
28	85 07.1	129 56	983.2357	+ 52.6
28	85 08.6	129 47	983.2377	+ 54.2
29	85 10.1	129 39	983.2395	+ 55.7
29	85 11.6	129 30	983.2413	+ 57.1
30	85 13.1	129 22	983.2445	+ 59.9
30	85 14.6	129 14	983.2435	+ 58.5
31	84 17.1	129 05	983.2360	+ 50.4
31	84 18.6	128 57	983.2285	+ 42.5
1 SEP	84 20.0	128 49	983.2276	+ 41.3
1	84 21.5	128 41	983.2307	+ 44.0
2	84 23.0	128 33	983.2296	+ 42.6
2	84 24.7	128 24	983.2411	+ 53.6
3	85 26.5	128 16	983.2437	+ 55.8
3	85 31.0	127 58	983.2477	+ 58.7
4	85 33.5	127 44	983.2494	+ 59.9
4	85 36.0	127 29	983.2548	+ 64.7
5	85 38.5	127 15	983.2593	+ 68.6
5	85 41.1	127 00	983.2619	+ 70.6
6	85 43.0	126 33	983.2597	+ 68.0
6	85 44.9	126 06	983.2579	+ 65.8
7	85 46.8	125 39	983.2545	+ 61.9
7	85 48.7	125 12	983.2336	+ 40.6
8	85 50.6	124 45	983.2220	+ 28.6
8	85 52.4	124 18	983.2247	+ 30.9
9	85 54.3	123 50	983.2208	+ 26.6
9	85 54.7	123 34	983.2094	+ 15.1
10	85 53.9	123 18	983.2052	+ 11.1
10	85 53.1	123 02	983.2076	+ 13.6
11	85 52.3	122 46	983.2025	+ 8.7
11	85 51.5	122 31	983.1993	+ 5.0
12	85 50.8	122 15	983.2072	+ 13.8
12	85 50.0	122 00	983.2235	+ 30.2
13	85 51.0	121 50	983.2266	+ 33.1
13	85 52.1	122 00	983.2127	+ 19.0
14	85 53.2	122 05	983.2014	+ 7.4
14	85 54.2	122 10	983.1951	+ 0.9
15	85 55.3	122 20	983.1953	+ 0.9
15	85 56.4	122 35	983.1969	+ 2.2
16	85 55.2	123 00	983.1987	+ 4.3
16	85 54.0	123 20	983.2025	+ 8.3
17	85 52.8	123 26	983.2041	+ 10.2
17	85 51.7	123 31	983.2127	+ 19.0
18	85 51.5	122 47	983.2166	+ 23.0
20	85 48.5	122 23	983.2318	+ 38.9
20	85 45.5	121 00	983.2315	+ 39.2
21	85 46.0	121 35	983.2297	+ 37.3
22	85 47.0	121 10	983.2424	+ 49.8
22	85 48.0	120 45	983.2229	+ 30.1
24	85 49.0	120 25	983.2420	+ 49.0
25	85 50.0	120 05	983.2429	+ 49.6
26	85 49.0	119 45	983.2535	+ 60.5
27	85 47.3	119 54	983.2553	+ 62.6
29	85 44.8	120 06	983.2477	+ 55.6
29	85 44.6	120 08	983.2543	+ 62.2
29	85 44.5	120 09	983.2595	+ 67.4

DATE (1958)	LATITUDE (NORTH)	LONGITUDE (WEST)	OBSERVED GRAVITY (GALS)	FREE AIR ANOMALIES (MGALS)
29 SEP	85 44.4	120 10	983.2618	+ 69.8
29	85 44.0	120 12	983.2765	+ 84.6
29	85 44.0	120 12	983.2752	+ 83.3
30	85 42.3	120 21	983.2818	+ 90.2
1 OCT	85 41.9	120 25	983.2854	+ 93.9
1	85 41.9	120 25	983.2861	+ 94.6
2	85 40.2	120 34	983.2852	+ 94.1
2	85 38.7	120 40	983.2872	+ 96.5
3	85 39.5	120 31	983.2906	+ 99.7
3	85 39.3	120 05	983.2899	+ 99.0
4	85 41.0	119 55	983.2860	+ 94.7
4	85 44.0	119 20	983.2660	+ 74.1
5	85 47.0	118 50	983.2415	+ 48.9
6	85 50.0	119 15	983.2044	+ 11.1
6	85 53.0	119 50	983.1821	- 11.8
7	85 53.1	120 25	983.1775	- 16.5
8	85 52.5	120 21	983.1789	- 14.9
9	85 52.0	120 00	983.1792	- 14.5
10	85 54.0	119 50	983.1824	- 11.7
10	85 56.0	119 40	983.1884	- 6.2
11	85 58.0	119 20	983.1957	+ 0.7
12	85 58.8	119 05	983.1952	0.0
12	85 59.3	119 15	983.2003	+ 5.0
13	86 01.0	119 25	983.2130	+ 17.4
14	86 02.6	119 35	983.2104	+ 14.4
15	86 03.4	119 52	983.2232	+ 27.1
16	86 05.0	120 12	983.2214	+ 24.9
16	86 06.0	120 25	983.2229	+ 26.2
18	86 07.7	120 50	983.2365	+ 39.5
18	86 08.7	121 00	983.2271	+ 29.9
21	86 12.0	121 48	983.2700	+ 72.1
22	86 18.0	121 40	983.2657	+ 66.6
22	86 23.3	121 42	983.2629	+ 62.8
23	86 24.0	120 40	983.2637	+ 63.5
24	86 23.5	119 10	983.2663	+ 66.2
25	86 23.0	117 40	983.2616	+ 61.6
27	86 22.1	116 23	983.2338	+ 33.9
28	86 20.9	116 10	983.2376	+ 38.0
28	86 18.9	115 45	983.2504	+ 51.2
30	86 15.0	115 10	983.2756	+ 77.1
30	86 13.8	114 55	983.2843	+ 86.1
31	86 11.5	114 35	983.2827	+ 84.9
1 NOV	86 09.5	114 08		
1	86 10.5	113 38	983.2065	+ 8.9
2	86 11.5	113 08	983.2302	+ 32.4

5.2 T-3 (Bravo) Gravity

At T-3 the following instruments were used:

North American Gravity Meter 113a (dial constant 0.21322 milligal/dial division) from May 1957 through April 1959 and September 1959 through July 1960.

Worden Gravimeter E-340 (dial constant 0.2276 milligal/dial division) from 11 April through 2 September 1959.

Although the North American meter was essentially drift free when operating properly, it was quite sensitive to temperature changes caused either by the inadequacy of the heaters in maintaining operating temperature at low ambient air temperatures (below 5°C) or by minor malfunctions in the heater control circuits. In the first case, tares produced by changing instrument temperatures were often noticeable and some estimate could be made of their order of magnitude; however, in the second case, the tares were more subtle and frequent, apparently due to the instability of the inner heating circuit. In addition others possibly occurred during the transport of the instrument from the ice station to the reference sites. The consequence of these tares was several mis-ties of orders of magnitude of 15 to 30 milligals. As it was impossible to distribute these misclosures among the known tares with certainty, only those data taken with the North American meter that had misclosures less than one or two milligals have been included in this report.

Observations made with the Worden E-340 from 11 April through 2 September 1959, with computed free air and Bouguer anomalies, are being presented by the U. S. Geological Survey (Keller, et al.,¹³ in preparation).

From May through September 1958, the drift rate of the North American was negligible, as ties made to the Thule, Greenland, station of the worldwide gravimeter network at the beginning and end of this period differed by less than 0.5 milligal. Observed gravity at the Thule site was 982.9280 gals (Woolard,²⁴ 1960, Table III-A-7.8). After a free air correction was applied for the elevation of the instrument above sea level, free-air anomalies were computed according to the International Formula. Simple Bouguer, or "depth-corrected," anomalies, assuming standard densities for sea water ($\rho = 1.02$) and crustal rocks ($\rho = 2.65 \text{ g/cm}^3$), are also given. For the latter computations the ice island was assumed to be in isostatic equilibrium; so no Bouguer correction was applied to compensate for its mass above and below sea level.

Data taken from 25 March through 31 July 1960, have been corrected to sea level by applying a free-air correction using elevations determined by leveling surveys. The instrument was tied to the Fairbanks pendulum site ($G = 982.2444$ gals, Woolard,²⁴ 1960, Table III-A-6) in March and September. The difference in readings was less than 0.5 milligal. Depth soundings, interpolated when necessary, have been included with the gravity values.

DATE (1958)	TIME (GMT)	LATITUDE (NORTH)	LONGITUDE (WEST)	EST. ERROR (MILES)	OBS. GRAVITY (GALS)	FREE AIR ANOMALY (MGALS)	EST. ERROR (MGALS)	BOUGUER ANOMALY (MGALS)
5	MAY	2135	80 17	114 00	1	983.106	35	120
6		2240	80 18	114 00	1	983.106	35	121
7		2245	80 17	114 10	2	983.104	33	120
8		2240	80 16	114 30	2	983.099	29	117
9		1315	80 15	114 40	1	983.096	26	117
9		2230	80 15	114 50	1	983.095	25	117
10		1405	80 12	115 10	2	983.093	24	119
10		2235	80 11	115 10	2	983.091	23	118
11		1345	80 08	115 40	3	983.089	23	118
11		2230	80 08	115 40	3	983.088	22	116
12		1250	80 05	116 00	4	983.090	26	119
12		2250	80 02	116 00	4	983.093	29	121
13		1345	79 59	116 10	5	983.094	32	122
13		2235	79 58	116 10	5	983.095	33	122
14		1335	79 59	116 00	5	983.095	34	123
14		2240	79 58	116 00	5	983.096	34	123
15		1240	79 59	116 00	3	983.095	33	123
15		2310	80 00	116 00	3	983.092	30	122
16		2235	80 02	116 00	3	983.088	25	121
17		1250	80 04	115 50	4	983.089	25	120
17		2250	80 05	115 50	4	983.091	26	121
18		2245	80 05	115 50	3	983.095	31	123
19		1330	80 01	115 50	1	983.095	32	122
19		2240	80 01	115 50	1	983.098	35	124
20		1310	80 00	115 50	1	983.101	38	124
20		2240	80 00	115 50	1	983.102	40	125
21		1310	79 59	115 50	2	983.104	42	126
21		2235	79 59	115 50	2	983.105	43	127
22		1310	79 58	115 50	2	983.105	44	128
22		2235	79 58	115 50	2	983.105	44	128
23		2235	79 59	115 40	2	983.105	43	127
24		1315	80 00	115 40	3	983.105	42	125
24		2230	80 00	115 40	3	983.104	41	125
25		2230	79 59	115 40	2	983.104	42	126
26		1335	79 58	115 40	1	983.105	44	127
26		2225	79 58	115 40	1	983.106	46	128
27		1305	79 55	115 40	2	983.109	49	130
27		2305	79 55	115 40	2	983.110	50	131
28		1310	79 54	115 40	3	983.112	53	133
28		2310	79 53	115 40	3	983.112	54	133
29		1315	79 51	115 30	4	983.113	55	132
29		2330	79 51	115 30	4	983.114	57	133
30		1305	79 52	115 30	3	983.115	57	133
30		2310	79 52	115 30	3	983.115	57	133
31		1300	79 52	115 30	2	983.115	57	133
31		2315	79 52	115 30	2	983.115	57	133
1	JUN	1415	79 52	115 30	2	983.115	57	133
1		2340	79 52	115 30	2	983.115	57	133
2		1300	79 53	115 30	2	983.115	57	133
2		2300	79 53	115 30	2	983.115	56	132
3		1235	79 53	115 20	3	983.115	56	132
3		2300	79 53	115 20	3	983.115	56	132
4		1255	79 52	115 10	3	983.115	57	133
4		2330	79 52	115 10	3	983.115	57	133
5		1300	79 50	115 20	3	983.115	57	134
5		2315	79 49	115 20	3	983.114	57	135
6		0015	79 49	115 40	3	983.114	57	135
6		1315	79 49	115 40	3	983.113	56	135
6		2305	79 49	115 40	4	983.111	54	135
7		1310	79 50	116 20	5	983.104	47	130
7		1650	79 51	116 20	5	983.105	47	131
7		2315	79 51	116 20	5	983.103	46	131
8		1300	79 52	116 30	5	983.103	45	131
8		2250	79 52	116 30	5	983.103	45	132

DATE (1958)	TIME (GMT)	LATITUDE (NORTH)	LONGITUDE (WEST)	EST. ERROR (MILES)	OBS. GRAVITY (GALS)	FREE AIR ANOMALY (MGALS)	EST. ERROR (MGALS)	BOUGUER ANOMALY (MGALS)
9 JUN	0025	79 51	116 40	4	983.103	45	3	132
9	0410	79 51	116 40	4	983.104	46	3	133
9	1305	79 50	116 40	3	983.104	47	3	134
9	2305	79 49	116 40	3	983.104	47	3	134
10	1305	79 48	116 40	2	983.105	49	3	137
10	2310	79 48	116 40	2	983.106	50	3	136
11	1300	79 47	116 40	2	983.107	52	3	136
11	2305	79 47	116 40	2	983.108	52	2	136
12	1310	79 46	116 30	2	983.108	53	1	136
12	2305	79 46	116 30	2	983.108	53	1	135
13	1310	79 45	116 30	2	983.108	54	1	136
13	2320	79 45	116 30	3	983.108	54	1	136
14	1305	79 46	116 20	4	983.109	54	1	136
14	2305	79 46	116 20	4	983.108	54	1	136
15	1440	79 47	116 20	7	983.109	54	2	136
16	0035	79 47	116 20	7	983.109	53	2	135
16	1305	79 48	116 20	7	983.109	53	2	135
16	2305	79 48	116 20	6	983.109	53	2	135
17	1305	79 48	116 10	4	983.109	53	1	134
18	0015	79 48	116 10	3	983.109	53	1	134
18	1300	79 48	116 10	2	983.109	53	1	134
18	2310	79 48	116 10	2	983.109	53	1	134
19	1305	79 48	116 10	2	983.109	53	1	134
19	2300	79 48	116 10	2	983.109	54	1	135
20	1305	79 47	116 10	2	983.110	54	1	134
20	2320	79 47	116 10	2	983.109	54	1	134
21	1310	79 46	116 10	2	983.110	54	1	134
21	2325	79 46	116 10	2	983.110	55	1	135
22	1435	79 46	116 10	2	983.110	55	1	135
22	2345	79 46	116 10	2	983.110	55	1	135
23	1255	79 45	116 10	2	983.110	55	1	135
23	2300	79 45	116 20	2	983.110	55	1	135
24	1300	79 45	116 20	2	983.110	56	1	136
24	2300	79 45	116 20	2	983.110	56	1	136
25	1300	79 44	116 20	1	983.110	56	1	137
25	2315	79 44	116 20	1	983.110	56	1	137
26	1305	79 44	116 20	2	983.110	56	1	137
26	2340	79 43	116 20	2	983.110	56	1	137
27	1255	79 43	116 20	2	983.110	56	1	137
27	2300	79 43	116 20	2	983.110	56	1	137
28	1235	79 42	116 20	2	983.110	57	1	137
28	2300	79 42	116 20	2	983.110	57	1	137
29	1425	79 42	116 20	2	983.110	57	1	137
30	0350	79 41	116 20	2	983.110	57	1	138
30	1305	79 41	116 20	2	983.110	57	1	138
30	2300	79 41	116 20	2	983.110	57	1	139
1 JUL	1315	79 39	116 30	3	983.109	57	1	141
1	1740	79 39	116 30	3	983.108	56	2	141
1	2015	79 39	116 30	3	983.106	55	2	140
1	2310	79 38	116 40	3	983.105	54	2	140
2	0330	79 38	116 40	4	983.104	53	2	139
2	1300	79 37	116 50	5	983.102	52	2	140
2	2250	79 37	116 50	6	983.101	51	3	140
3	1250	79 36	117 00	7	983.101	51	3	141
3	2300	79 36	117 10	7	983.100	50	3	142
04	1300	79 36	117 20	6	983.096	47	3	143
4	1505	79 36	117 20	6	983.096	46	3	143
4	2105	79 36	117 30	6	983.094	44	3	143
5	1255	79 36	117 30	5	983.090	40	3	143
5	2300	79 36	117 40	5	983.087	38	3	145
6	1430	79 36	117 50	4	983.084	35	3	147
6	1925	79 35	117 50	4	983.084	34	4	148
6	2355	79 34	118 00	4	983.084	35	4	150

DATE (1958)	TIME (GMT)	LATITUDE (NORTH)	LONGITUDE (WEST)	EST. ERROR (MILES)	OBS. GRAVITY (GALS)	FREE AIR ANOMALY (MGALS)	EST. ERROR (MGALS)	BOUGUER ANOMALY (MGALS)
07 JUL	1300	79 30	118 10	5	983.088	41	5	159
7	2235	79 29	118 10	5	983.088	43	5	165
8	0400	79 28	118 20	5	983.088	43	5	168
8	1310	79 27	118 20	6	983.089	44	4	171
8	1530	79 26	118 20	6	983.089	45	4	173
8	2255	79 25	118 30	7	983.088	44	3	174
9	1345	79 23	118 40	5	983.082	40	2	174
9	2330	79 22	118 40	5	983.077	35	1	170
10	0330	79 21	118 50	4	983.075	34	1	168
10	1245	79 20	118 50	3	983.072	31	1	165
10	2300	79 19	118 50	3	983.067	27	1	161
11	0405	79 18	118 50	3	983.064	24	2	158
11	1255	79 17	118 50	3	983.060	21	2	154
12	0345	79 16	118 50	2	983.060	21	1	154
12	1255	79 16	118 50	2	983.061	22	1	155
12	2300	79 16	118 50	2	983.062	24	1	157
13	0245	79 15	118 50	1	983.063	24	1	157
13	1430	79 15	118 50	1	983.061	23	1	155
14	0440	79 14	118 50	2	983.061	24	1	156
14	1255	79 13	118 50	2	983.062	24	1	156
14	2225	79 13	118 40	2	983.063	26	1	158
15	1250	79 12	118 40	3	983.066	30	2	161
15	2250	79 12	118 30	3	983.069	32	2	162
16	0435	79 11	118 20	3	983.069	33	2	163
16	1250	79 11	118 10	3	983.071	35	2	164
16	2150	79 12	118 10	3	983.072	35	2	164
17	1250	79 13	118 20	3	983.070	33	2	163
17	2305	79 13	118 20	3	983.069	32	1	162
18	1300	79 14	118 30	2	983.066	29	1	160
18	2305	79 14	118 30	2	983.065	27	1	159
19	1245	79 14	118 30	2	983.064	27	1	160
19	2305	79 14	118 30	2	983.064	26	1	158
20	1640	79 15	118 30	2	983.063	26	1	158
20	2335	79 15	118 40	2	983.063	26	1	158
21	1300	79 15	118 40	2	983.064	26	1	158
21	2330	79 15	118 40	2	983.065	27	1	158
22	1255	79 15	118 40	2	983.065	27	1	158
22	2310	79 15	118 40	2	983.065	27	1	158
23	1250	79 15	118 40	2	983.064	26	1	157
23	2310	79 15	118 50	2	983.063	25	1	156
24	1255	79 15	118 50	1	983.060	22	1	153
24	1730	79 15	118 50	1	983.058	20	1	151
24	2305	79 15	118 50	1	983.057	19	1	151
25	0315	79 14	118 50	2	983.057	18	1	150
25	1255	79 14	119 00	2	983.053	15	1	148
25	2315	79 13	119 00	2	983.051	13	1	148
26	0315	79 12	119 00	2	983.050	13	1	148
26	1530	79 11	119 00	2	983.047	12	1	149
26	2225	79 10	119 00	2	983.046	11	1	149
27	1425	79 08	119 00	2	983.044	10	1	149
27	2245	79 08	119 10	2	983.044	10	1	150
28	1300	79 07	119 10	1	983.045	11	1	153
28	2310	79 06	119 10	1	983.045	12	1	154
29	1250	79 05	119 20	2	983.046	13	1	156
29	2040	79 05	119 30	2	983.047	14	1	157
30	0210	79 04	119 30	1	983.048	16	1	160
30	1300	79 04	119 40	1	983.049	17	1	161
30	2310	79 04	119 40	1	983.049	17	1	160
31	1255	79 04	119 50	2	983.049	18	2	159
31	1910	79 04	119 50	3	983.050	18	2	160
1 AUG	0350	79 03	120 00	4	983.051	19	2	161
1	1300	79 03	120 10	4	983.053	22	2	165
1	2310	79 03	120 20	4	983.056	24	2	169
2	1250	79 02	120 30	4	983.057	26	2	173

DATE (1958)	TIME (GMT)	LATITUDE (NORTH)	LONGITUDE (WEST)	EST. ERROR (MILES)	OBS. GRAVITY (GALS)	FREE AIR ANOMALY (MGALS)	EST. ERROR (MGALS)	BOUGUER ANOMALY (MGALS)
2	AUG	2320	79 02	120 30	4	983.059	28	176
3		1440	79 01	120 40	4	983.061	30	181
3		1920	79 01	120 50	4	983.061	31	182
4		0005	79 01	121 00	4	983.062	32	184
4		1300	79 00	121 10	3	983.063	33	187
4		2320	79 00	121 20	3	983.064	34	188
5		1255	79 01	121 20	3	983.063	33	187
5		2300	79 01	121 10	3	983.063	33	187
6		1255	79 02	121 10	3	983.062	31	185
6		2320	79 02	121 10	3	983.060	29	182
7		1300	79 00	121 00	3	983.056	26	178
7		2345	78 59	121 10	3	983.052	22	173
8		1250	78 56	121 20	2	983.046	18	168
8		2320	78 54	121 20	2	983.040	14	163
9		1300	78 52	121 30	3	983.035	9	157
10		0035	78 52	121 30	2	983.031	6	154
10		1420	78 52	121 30	2	983.029	3	151
10		2340	78 52	121 30	2	983.028	3	152
11		1250	78 51	121 40	3	983.026	1	151
11		2310	78 51	121 40	3	983.025	0	151
12		1250	78 50	121 50	2	983.024	0	152
12		2305	78 50	122 00	2	983.023	-1	151
13		1255	78 50	122 00	2	983.022	-2	151
13		2315	78 50	122 00	2	983.022	-2	151
14		1255	78 50	122 00	2	983.021	-3	150
14		2300	78 51	122 00	2	983.021	-3	150
15		1255	78 52	122 00	1	983.021	-4	150
16		0020	78 53	122 10	2	983.019	-6	150
16		1300	78 54	122 10	3	983.018	-8	149
16		2315	78 53	122 20	3	983.018	-8	150
17		1425	78 51	122 30	4	983.018	-7	151
18		1250	78 50	122 40	4	983.017	-7	149
18		2320	78 49	122 50	4	983.017	-6	148
19		1215	78 48	122 50	3	983.016	-6	147
19		2320	78 47	122 40	2	983.016	-6	146
20		1305	78 45	122 40	1	983.015	-6	145
20		2335	78 44	122 40	1	983.016	-5	145
21		2220	78 44	122 40	1	983.016	-5	143
22		1250	78 43	122 50	2	983.017	-3	144
22		2310	78 42	123 00	3	983.018	-2	144
23		1300	78 42	123 10	4	983.019	-1	145
23		2300	78 42	123 10	4	983.019	-1	145
24		1415	78 42	123 20	4	983.018	-2	144
25		0025	78 43	123 30	4	983.017	-3	144
25		1240	78 43	123 30	4	983.016	-5	145
25		2305	78 45	123 30	4	983.014	-7	147
26		1235	78 47	123 40	5	983.012	-11	150
26		2240	78 50	123 40	6	983.015	-9	155
27		1300	78 52	123 40	7	983.020	-6	162
27		2345	78 53	123 40	7	983.022	-4	166
28		1530	78 55	123 40	8	983.021	-6	167
28		2300	78 56	123 50	9	983.020	-8	166
29		1245	78 57	124 00	10	983.018	-9	167
29		2305	78 56	124 00	10	983.018	-9	166
30		1300	78 54	124 10	9	983.020	-6	167
30		2235	78 53	124 10	9	983.022	-4	169
31		1420	78 52	124 10	8	983.018	-7	164
31		2330	78 51	124 10	8	983.014	-11	159
1	SEP	1250	78 49	124 10	7	983.013	-11	156
1		2305	78 48	124 10	7	983.014	-10	156
2		1240	78 47	124 20	6	983.010	-13	153
2		2300	78 46	124 20	5	983.009	-12	153
3		1300	78 44	124 20	4	983.011	-10	153

DATE (1958)	TIME (GMT)	LATITUDE (NORTH)	LONGITUDE (WEST)	EST. ERROR (MILES)	OBS. GRAVITY (GALS)	FREE AIR ANOMALY (MGALS)	EST. ERROR (MGALS)	BOUGUER ANOMALY (MGALS)
3 SEP	2220	78 42	124 20	4	983.011	-8	2	152
4	1225	78 40	124 10	3	983.012	-6	2	152
4	2235	78 39	124 10	3	983.013	-4	2	149
5	1250	78 37	124 10	2	983.016	0	1	149
5	2320	78 35	124 10	2	983.017	3	2	140
6	1255	78 32	123 50	6	983.020	7	3	128
6	2315	78 33	123 50	6	983.020	6	3	129
7	1300	78 36	123 40	7	983.017	1	3	131
7	2255	78 36	123 40	7	983.014	-2	3	130
8	1300	78 37	123 30	7	983.014	-3	4	130
8	2300	78 37	123 30	7	983.012	-4	4	127
9	1250	78 36	123 20	8	983.003	-13	3	114
9	2200	78 36	123 10	8	983.000	-15	3	108
10	1300	78 34	122 50	6	982.993	-21?	3	86?
10	2305	78 32	122 40	6	983.006	-7	3	90
11	1255	78 30	122 30	4	983.010	-2	2	86
11	2255	78 29	122 20	3	983.009	-3	2	80
12	1300	78 28	122 20	2	983.011	-1	1	78
12	2300	78 28	122 20	2	983.012	1	2	78
13	1250	78 27	122 30	3	983.012	1	2	76
13	2300	78 27	122 30	3	983.012	1	2	76
14	1300	78 27	122 30	4	983.013	3	2	78
14	2300	78 27	122 30	5	983.013	3	2	78
15	1245	78 27	122 30	6	983.014	4	2	79
15	2330	78 25	122 30	6	983.014	4	2	76
16	1250	78 24	122 30	7	983.015	6	3	75
16	2300	78 24	122 30	7	983.008	1	3	63
17	0015	78 23	122 00	8	983.010	3	3	64
17	0125	78 22	122 00	8	983.013	6	3	66
17	0345	78 21	122 00	8	983.023	16	3	74
17	0420	78 20	122 00	8	983.023	17	3	75
17	1255	78 19	122 00	8	983.026	20	3	70
17	2235	78 19	122 00	9	983.025	20	3	71
18	1300	78 19	122 00	10	983.022	16	4	71
18	2305	78 18	122 00	10	983.021	16	4	72
19	1300	78 16	122 00	10	983.020	16	4	71
19	2330	78 16	122 00	10	983.020	16	4	71
20	1305	78 17	122 00	10	983.021	16	4	70
20	2050	78 17	122 00	10	983.020	16	4	70

DATE (1960)	TIME (GMT)	LATITUDE (NORTH)	LONGITUDE (WEST)	SEA LEVEL GRAVITY (GALS)	OCEAN DEPTH (METERS)
25 MAR	0015	72 03	152 21	982.749	2220
25	1815	72 07	152 53	982.747	2050
26	0545	72 08	153 09	982.763	2012
26	1845	72 10	153 27	982.747	2076
1 APR	0315	72 11	154 02	982.729	1965
1	1800	72 11	154 02	982.729	1955
2	0430	72 11	154 01	982.729	1965
2	1815	72 11	154 01	982.729	2000
3	0930	72 11	154 02	982.729	1975
3	1800	72 11	154 02	982.729	1940
4	1800	72 11	154 06	982.729	1800
5	1015	72 10	154 14	982.727	1740
5	1815	72 11	154 20	982.723	1695
6	1045	72 09	154 34	982.733	1570
6	1945	72 09	154 43	982.736	1425
6	2245	72 09	154 45	982.734	1400
7	0815	72 09	154 55	982.745	1130
7	1745	72 09	155 08	982.755	801
8	0745	72 11	155 28	982.772	441
8	1345	72 11	155 35	982.778	369
8	1915	72 10	155 40	982.778	308
9	1815	72 09	156 06	982.755	207
10	2145	72 06	156 27	982.738	155
11	0930	72 03	156 31	982.732	139
11	1830	72 03	156 35	982.729	126
12	1030	72 01	156 44	982.719	103
12	1915	71 59	156 51	982.721	91
13	0815	71 55	157 02	982.733	76
13	1815	71 54	157 10	982.733	74
15	0930	71 50	157 13	982.729	66
15	1930	71 49	157 13	982.728	64
16	1815	71 47	157 12	982.726	64
17	2115	71 45	157 11	982.724	63
18	1030	71 45	157 10	982.723	63
18	1900	71 45	157 12	982.723	63
19	0730	71 44	157 14	982.722	63
20	1915	71 43	157 23	982.722	62
21	0845	71 43	157 27	982.722	62
21	1845	71 43	157 27	982.721	62
22	0045	71 43	157 26	982.722	62
22	0630	71 43	157 26	982.722	62
22	0945	71 43	157 26	982.722	62
22	2130	71 43	157 26	982.722	63
23	0430	71 43	157 27	982.722	63
29	0830	71 44	157 50	982.721	62
29	1815	71 44	157 57	982.721	62
29	2245	71 45	158 01	982.722	62
30	0745	71 45	158 07	982.723	60
30	1845	71 46	158 15	982.726	56
30	2315	71 47	158 20	982.727	56
1 MAY	0845	71 47	158 26	982.731	55
1	1930	71 48	158 34	982.736	55
2	0945	71 49	158 49	982.751	55
2	1830	71 50	158 55	982.756	52
2	2245	71 51	158 57	982.758	50
3	1015	71 54	159 06	982.762	50
3	1915	71 54	159 12	982.762	49
4	0945	71 55	159 21	982.757	48
4	2000	71 55	159 24	982.754	46
5	1015	71 55	159 29	982.752	47
6	0015	71 54	159 33	982.748	48
6	0945	71 54	159 37	982.746	49
6	2030	71 53	159 37	982.745	49

DATE (1960)	TIME (GMT)	LATITUDE (NORTH)	LONGITUDE (WEST)	SEA LEVEL GRAVITY (GALS)	OCEAN DEPTH (METERS)
7	1000	71 53	159 37	982.744	49
8	0915	71 52	159 38	982.743	51
8	2030	71 52	159 34	982.744	50
9	1930	71 52	159 34	982.747	50
10	0700	71 51	159 33	982.748	51
10	2015	71 50	159 32	982.749	51
11	0645	71 50	159 30	982.750	50
11	2245	71 50	159 30	982.749	50
12	1845	71 50	159 38	982.744	50
13	1845	71 51	159 41	982.744	50
14	0715	71 51	159 42	982.744	50
14	2115	71 52	159 44	982.744	50
15	0630	71 51	159 43	982.744	51
15	1945	71 51	159 42	982.744	52
16	1915	71 51	159 40	982.742	52
17	2230	71 51	159 41	982.741	52
18	0845	71 51	159 44	982.740	50
18	1830	71 51	159 47	982.740	46
19	0545	71 51	159 50	982.739	45
19	2045	71 51	159 54	982.736	44
20	0800	71 51	159 57	982.733	43
20	1900	71 51	160 00	982.731	43
21	0645	71 51	160 03	982.730	42
21	1845	71 51	160 06	982.731	43
23	0745	71 51	160 16	982.731	40
23	1900	71 50	160 19	982.730	41
24	1900	71 51	160 21	982.730	41
25	0830	71 51	160 21	982.730	41
25	1915	71 51	160 20	982.730	41
26	0745	71 51	160 20	982.730	41
26	1830	71 51	160 21	982.730	42
27	0830	71 50	160 21	982.730	42
27	1815	71 50	160 21	982.730	43
28	1015	71 50	160 21	982.730	43
28	1915	71 50	160 21	982.730	43
29	2145	71 50	160 21	982.730	43
30	1845	71 50	160 21	982.730	43
31	0745	71 50	160 21	982.730	43
31	1830	71 50	160 21	982.730	43
15 JULY	2200	71 50	160 21	982.730	43
16	0000	71 50	160 21	982.730	43
17	0015	71 46	160 08	982.722	48
17	1030	71 47	160 09	982.722	48
17	2100	71 47	160 09	982.723	48
18	0800	71 47	160 07	982.723	48
18	1815	71 48	160 05	982.724	47
19	1830	71 49	159 57	982.730	47
20	0630	71 49	159 52	982.733	47
20	1830	71 50	159 47	982.737	47
21	1945	71 50	159 42	982.739	48
22	0645	71 50	159 43	982.739	48
22	1700	71 50	159 44	982.739	--
23	0830	71 49	159 46	982.737	--
23	1915	71 49	159 48	982.737	--
24	0800	71 49	159 49	982.737	--
24	2200	71 49	159 50	982.734	--
25	0630	71 49	159 52	982.732	--
25	1830	71 49	159 55	982.729	--
26	1815	71 50	160 09	982.727	--
27	0830	71 51	160 14	982.729	--
27	1830	71 52	160 16	982.730	42
28	0715	71 51	160 20	982.730	--
28	1930	71 52	160 20	982.730	37

DATE (1960)	TIME (GMT)	LATITUDE (NORTH)	LONGITUDE (WEST)	SEA LEVEL GRAVITY (GALS)	OCEAN DEPTH (METERS)
29	0815	71 52	160 20	982.730	37
29	1915	71 52	160 20	982.730	37
30	0800	71 52	160 20	982.731	37
30	1815	71 52	160 20	982.730	37
31	2200	71 52	160 20	982.731	37

6. MAGNETICS

One or more of the components of the earth's magnetic field were measured at the three drifting stations during the period covered by this report. Only the values taken at intervals are presented here; the continuously recorded data are being reported by other agencies.

Declination was the most frequently measured component. At each station horizontal control was defined by a line established by two poles frozen into the ice. The instrument was placed on this line and aligned by sighting at one pole; reversed readings were taken to the second marker. The orientation of the reference line and station positions were determined by celestial navigation, with interpolation as necessary.

6.1 Alpha Magnetism

At Station ALPHA two instruments were used to measure the magnetic field. An Askania variograph continuously recorded the relative changes in the D, Z, and H components. These data were obtained by the Lamont Geological Observatory and the records deposited at the IGY Data Center B (US Coast and Geodetic Survey) in Washington, D. C. Lamont personnel also measured at intervals the absolute values of D and H with a U. S. C. & G.S. transit magnetometer (Hunkins,¹¹ 1960), which are listed here.

TIME (GMT)	DATE (1958)	LATITUDE (NORTH)	LONGITUDE (WEST)	D (DEGREES)	H (GAUSS)
2143-2201	26 MAR	83 47.2	153 00	63 28	
0042-0110	27	83 47.2	153 00		0.01379
1957-2024	1 APR	83 48.0	152 45	71 20	
2024-2056	1	83 48.0	152 45		0.01660
2130-2152	12	83 50.8	151 50	78 00	
0122-0149	13	83 51.1	151 49		0.01559
0100-0119	1 MAY	83 54	152 39	75 03	
0119-0142	1	83 54	152 39		0.01496
0058-0116	12	83 43.7	153 12	56 21	
0116-0132	12	83 43.7	153 12		0.01745
0027-0052	4 JUN	83 56.0	151 40	91 51	
0052-0113	4	83 56.0	151 40		0.01907
2045-2143	30	84 40.6	147 50	91 18	
0113-0137	15 JUL	84 33.1	142 37	137 36	
0145-0202	15	84 33.1	142 37		0.01419
2014-2056	22	84 39.1	142 22	157 36	
2112-2143	22	84 39.1	142 22		0.01455
1912-1937	29	85 01	138 00	118 00	
2003-2025	29	85 01	138 00		0.01426
2021-2041	5 AUG	85 03.0	138 53	122 42	
2157-2219	5	85 03.0	138 53		0.01298
2053-2114	12	84 58	136 05	130 19	
2121-2142	12	84 58	136 05		0.01363
2203-2222	15	85 00	135 30	122 30	
2222-2239	15	85 00	135 30		0.01450
1935-2010	19	85 01.8	134 31	123 30	
2042-2109	19	85 01.8	134 31		0.01413
2333-0011	22-23	85	132	141 30	
0045-0115	23	85	132		0.01103
0058-0116	26	85 04.8	130 40	145 06	
0116-0137	26	85 04.8	130 40		0.01344
2338-2400	29	85 15	129	171 00	
0000-0030	30	85 15	129		0.00964
0213-0234	3 SEP	85 26.5	128 16	208 36	
0220-0255	6	85 41.1	127 17		0.01010
0144-0215	6	85 41.1	127 17	207 24	
0122-0150	10	85 54.7	123 34	189 12	
0159-0220	10	85 54.7	123 34		0.02105
0052-0103	12	85 50	122	178 06	
0103-0129	13	85 50	122		0.02400
2032-2109	16	85 54	123 33	172 06	
2120-2150	16	85 54	123 33		0.01956

6.2 T-3 (Bravo) Magnetics

Most of the reliable data from this station consist of declination values. An Askania variograph and a prototype proton precession magnetometer were in operation for short periods, but instrumental difficulties precluded the establishment of any regular program of data collection.

From 25 November 1957 through 25 May 1958, a three-inch surveying compass was used for the measurements. Because of the weak horizontal component of the magnetic field it was customary to give the compass needle a noticeable vertical oscillation to prevent sticking before the needle had assumed the correct position. Field observers have noted that occasionally the peak-to-peak amplitude of the horizontal needle swings approached a maximum of 20° ; so in such cases the averages were used. A Ruska magnetometer was used from 6 November 1958, through 9 April 1959. With this instrument the horizontal oscillations mentioned above were no longer evident. Values during this period are accurate to about 0.3° (because of limitations in the navigational sight reduction method) but are tabulated to 0.1° . For the remainder of the occupation of the island a five-inch surveying compass was available, and no difficulty with horizontal instability was experienced. The results from the summer of 1959 are being published by the U. S. Geological Survey in a contract report (Keller, et al.,¹³ in preparation); other gaps in the data are the result of malfunctions of the magnetic or navigational instruments.

DATE (1957)	TIME (GMT)	LATITUDE (NORTH)	LONGITUDE (WEST)	DECLINATION (EAST)
25 NOV	1645	80 41	110 50	155
26	1645	80 40	111 00	154
1 DEC	0700	80 31	111 55	126 (*)
1958				
23 JAN	0030	80 39	112 20	161
23	2345	80 39	112 20	153
24	2255	80 39	112 19	180
26	2310	80 41	112 29	155
27	2315	80 41	112 43	156
28	2320	80 37	112 56	150
31	2325	80 19	113 10	142
1 FEB	2300	80 17	113 11	148
2	2150	80 18	113 17	142
3	2325	80 18	113 21	146
4	2210	80 18	113 25	144
5	2050	80 23	113 08	145
6	2115	80 26	112 55	147
7	2255	80 24	112 55	139
8	2315	80 23	112 55	142
9	2250	80 24	112 50	141
10	2305	80 23	112 48	135
11	2250	80 23	112 47	144
12	2255	80 22	112 45	141
13	2255	80 22	112 45	147
14	2315	80 22	112 45	135
15	2305	80 22	112 46	135
16	2320	80 22	112 50	140
17	2250	80 21	112 46	141
18	2310	80 22	112 42	143
19	2245	80 22	112 40	137
20	2315	80 22	112 40	138
21	2315	80 22	112 40	139
22	2255	80 22	112 41	144
23	2235	80 22	112 42	141
24	2255	80 22	112 43	136
25	2255	80 22	112 44	136
26	2250	80 22	112 45	134
27	2250	80 21	112 46	135
28	2310	80 21	112 46	136
1 MAR	2335	80 21	112 47	140
2	2240	80 21	112 48	134
3	2250	80 21	112 49	139
4	2325	80 21	112 50	141
5	2240	80 21	112 50	137
6	2240	80 21	112 50	135
7	2300	80 21	112 50	138
8	2255	80 21	112 50	140
9	2245	80 21	112 53	140
10	2320	80 21	112 57	142
11	2315	80 20	113 02	148
12	2255	80 20	113 05	143
13	2315	80 20	113 02	140
14	2310	80 19	112 59	138
15	2320	80 19	112 55	138
16	2240	80 18	112 59	140
17	2245	80 16	113 04	136
18	2235	80 16	113 03	139
19	2245	80 17	112 59	139
20	2240	80 18	112 56	141
21	2250	80 18	112 59	136
22	2250	80 18	113 04	139

DATE (1958)	TIME (GMT)	LATITUDE (NORTH)	LONGITUDE (WEST)	DECLINATION (EAST)
15 NOV	0800	77 49	123 00	63.3
16	0700	77 45	123 03	61.9
17	0930	77 44	123 05	71.1
18	0430	77 43	123 03	70.9
19	0300	77 40	123 05	71.0
20	0800	77 36	123 09	70.5
21	0730	77 33	123 13	74.7
22	0925	77 31	123 16	69.6
24	0315	77 26	123 18	69.4
25	0350	77 22	123 23	69.9
26	0935	77 16	123 30	72.9
27	0615	77 12	123 33	68.7
28	0605	77 09	123 32	69.9
29	0455	77 04	123 41	69.9
30	0255	76 57	123 57	68.0
1 DEC	0438	76 50	124 12	63.3
2	0325	76 43	124 16	62.5
3	0845	76 35	124 22	62.7
3	1655	76 33	124 24	62.7
4	0348	76 31	124 27	61.4
5	0410	76 28	124 27	60.8
6	0220	76 27	124 21	60.5
7	0640	76 26	124 23	60.6
8	0247	76 20	124 32	61.0
8	1726	76 16	124 51	60.9
8	1934	76 15	124 54	61.3
9	2206	76 14	124 58	61.8
9	0016	76 14	124 59	61.3
9	0212	76 13	125 02	60.5
9	0409	76 13	125 05	60.4
9	0501	76 12	125 06	59.4
9	0606	76 12	125 08	59.9
9	0714	76 12	125 08	58.9
10	0700	76 05	125 30	59.4
11	0841	75 59	125 39	59.0
12	0636	75 54	125 41	58.0
13	1727	75 43	125 45	59.2
16	0628	75 30	125 58	57.4
17	0656	75 27	126 11	56.8
1959				
2 FEB	1845	74 22	128 17	55.9
4	1955	74 11	128 23	54.7
7	0450	74 09	128 23	52.1
8	2355	74 09	128 25	53.0
10	0430	74 08	128 27	52.2
11	0535	74 08	128 28	52.8
12	0735	74 08	128 30	50.9
13	0825	74 07	128 29	50.7
14	0730	74 07	128 28	51.0
16	0815	74 07	128 26	54.0
17	0815	74 08	128 27	50.7
18	0745	74 09	128 28	51.8
19	2330	74 11	128 32	52.4
20	0825	74 11	128 33	52.8
21	0830	74 12	128 35	52.1
22	0830	74 09	128 31	51.7
23	0945	74 07	128 27	50.5
24	0830	74 07	128 22	51.7
25	1700	74 05	128 22	52.3
26	1635	74 05	128 20	54.1
27	1640	74 05	128 20	53.5

DATE (1959)	TIME (GMT)	LATITUDE (NORTH)	LONGITUDE (WEST)	DECLINATION (EAST)
28 FEB	1635	74 06	128 21	51.8
2 MAR	1640	74 05	128 19	52.5
3	1635	74 05	128 21	51.7
4	1645	74 05	128 22	52.4
6	1630	74 05	128 20	52.4
7	1620	74 05	128 19	52.9
9	1710	74 05	128 19	52.7
10	1707	74 05	128 21	53.0
11	1650	74 05	128 18	52.4
12	1655	74 06	128 17	54.2
14	1705	74 05	128 18	53.8
15	0145	74 05	128 18	52.4
15	1640	74 05	128 19	52.7
16	1645	74 05	128 21	52.8
18	1800	74 05	128 21	53.2
19	1635	74 05	128 22	52.7
20	1635	74 05	128 20	52.9
22	1925	74 05	128 23	52.6
23	2350	74 05	128 23	53.2
24	1630	74 05	128 22	53.2
25	1700	74 05	128 23	54.7
26	1650	74 05	128 23	53.9
27	1645	74 05	128 22	54.7
28	1810	74 06	128 23	55.3
30	0445	74 06	128 23	51.4
30	1615	74 06	128 23	53.9
31	1630	74 05	128 22	52.9
1 APR	1615	74 05	128 22	53.6
2	1715	74 05	128 25	53.6
3	2055	74 05	128 38	52.4
4	1635	74 05	128 48	51.9
6	0440	74 05	128 54	51.7
6	1630	74 05	128 53	52.2
7	1735	74 05	128 51	53.0
8	1615	74 04	128 51	51.3
9	2100	74 02	128 55	54.
5 OCT	2300	71 38	138 09	41
6	1845	71 38	138 11	44
7	1910	71 38	138 15	31(*)
8	1900	71 38	138 18	45
9	1845	71 37	138 23	37
10	1900	71 37	138 25	37
12	1850	71 38	138 46	38
13	1855	71 39	138 57	39
19	2100	71 33	138 47	47
20	2120	71 31	138 52	36
21	2125	71 30	139 02	42
22	2130	71 31	139 16	43
23	2100	71 31	139 23	44
24	2125	71 30	139 27	50
25	2130	71 29	139 30	48
27	2120	71 28	139 37	46
28	2120	71 27	139 45	42
30	1925	71 19	140 02	34
31	2300	71 17	140 19	36
2 NOV	1905	71 15	140 52	37
3	1840	71 13	141 01	41
4	1900	71 11	141 04	35
5	1915	71 09	141 08	35
6	1915	71 09	141 15	36
8	2320	71 07	141 20	41
10	1900	71 05	141 21	40
11	2310	71 04	141 25	39

DATE (1959)	TIME (GMT)	LATITUDE (NORTH)	LONGITUDE (WEST)	DECLINATION (EAST)
13 NOV	2315	71 02	141 45	41
14	2300	71 01	142 05	40
16	1905	71 01	142 23	39
17	2305	71 04	143 18	39
19	2300	71 10	144 13	38
20	2310	71 10	144 18	32
22	2310	71 09	144 20	35
23	2310	71 09	144 20	37
24	2315	71 09	144 21	34
25	2310	71 09	144 22	35
26	2315	71 09	144 23	37
27	2310	71 09	144 36	36
3 DEC	2320	71 11	146 17	32
4	2330	71 10	146 06	32
13	2305	71 05	145 04	34
14	2300	71 04	145 06	34
15	2320	71 04	145 05	35
16	2320	71 04	145 04	34
17	2325	71 04	145 05	36
18	2330	71 04	145 05	36
19	2330	71 05	145 06	37
20	2310	71 05	145 07	35
21	2310	71 05	145 05	34
23	2120	71 05	145 05	34
26	2330	71 04	145 02	32
1960				
1 JAN	2340	71 02	144 55	33
15	2340	71 00	145 15	34.5
20	2330	70 57	145 10	35
25	2250	70 53	145 50	35
31	0015	71 03	145 40	35.5
5 FEB	0105	71 12	146 50	34
8	0130	71 28	148 55	30.5
9	2325	71 35	150 00	34
15	2335	71 35	150 10	32
18	0115	71 36	150 20	31.5
20	0255	71 55	151 40	31
20	2055	71 57	152 05	32.5
27	2250	72 09	152 35	32
2 MAR	2150	72 06	152 30	32
6	0320	71 49	150 35	32
8	0415	71 48	150 30	31.5
12	0320	71 45	150 30	31
17	0440	71 46	150 35	31.5
22	0505	71 53	150 50	31.5
26	0530	72 08	153 10	29.5
27	0600	72 11	153 32	31
28	0530	72 14	153 57	31
29	1915	72 12	154 02	30
30	1830	72 11	154 02	30.5
31	0530	72 11	154 00	29.5
1 APR	1830	72 11	154 02	30
2	1830	72 11	154 01	29.5
4	0430	72 11	154 02	29.5
5	0400	72 10	154 12	29.5
7	0430	72 09	154 51	28
8	2330	72 10	155 45	29
9	1815	72 09	156 05	27
11	0445	72 05	156 29	27
16	0500	71 48	157 13	27
18	0140	71 45	157 11	26

DATE (1960)	TIME (GMT)	LATITUDE (NORTH)	LONGITUDE (WEST)	DECLINATION (EAST)
19 APR	0530	71 44	157 13	27
2 MAY	1930	71 50	158 55	24
3	1915	71 54	159 12	24.5
4	2315	71 55	159 25	24.5
5	0250	71 55	159 27	25
6	0935	71 54	159 37	24.5
6	2045	71 53	159 37	25
7	1000	71 53	159 37	24.5
9	0400	71 52	159 35	23
9	1845	71 52	159 33	25.5
9	2315	71 52	159 33	23.5
11	0900	71 50	159 30	25
15	0915	71 51	159 43	25.5
15	1945	71 51	159 42	23
20	2115	71 51	160 00	25.5
26	0745	71 50	160 21	24
28	0000	71 50	160 21	24
28	1840	71 50	160 21	25
30	1815	71 50	160 21	24.5
31	1830	71 50	160 21	24.5
1 JUN	1830	71 50	160 21	25
2	1830	71 50	160 21	24.5
3	1930	71 50	160 21	25
4	1845	71 50	160 21	25.5
5	2315	71 50	160 21	26
6	1845	71 50	160 21	25
7	1900	71 50	160 21	26
8	1830	71 50	160 21	25.5
9	1900	71 50	160 21	25.5
10	1915	71 50	160 21	25
11	1830	71 50	160 21	25.5
13	0330	71 50	160 21	24.5
13	1900	71 50	160 21	23.5
15	0230	71 50	160 21	24
15	2300	71 50	160 21	24.5
16	1845	71 50	160 21	25
17	2330	71 50	160 21	24.5
19	0345	71 50	160 21	25
19	2215	71 50	160 21	24.5
21	0730	71 50	160 21	24
21	1830	71 50	160 21	25
25	1830	71 50	160 21	27
27	1830	71 50	160 21	25
28	1830	71 50	160 21	25
2 JUL	1830	71 50	160 21	25
6	0515	71 50	160 21	24
8	1930	71 50	160 21	25
11	1945	71 50	160 21	24
12	1830	71 50	160 21	25
14	2045	71 50	160 21	25
18	1845	71 48	160 05	24.5
19	1915	71 49	159 57	25.5
20	1830	71 50	159 45	25.5
21	1930	71 50	159 43	24.5
22	2045	71 50	159 45	25.5
25	2330	71 49	159 57	23
26	1845	71 50	160 10	25
1 AUG	1830	71 52	160 20	25.5
2	1900	71 52	160 20	25
3	1830	71 52	160 20	26
4	1830	71 52	160 20	26
8	1815	71 52	160 20	26
9	2045	71 52	160 20	25.5

6.3 Charlie Magnetics

A nuclear resonance magnetometer, developed especially for the ice station (Hubbard and Lusk, ¹⁰ 1959), was operated by the Lamont Geological Observatory from July 1959 until the station's abandonment in January 1960. The sensing element of the instrument consisted of a plastic bottle filled with gasoline and wound in a coil of heavy wire. The protons in the hydrogen nuclei of the gasoline were aligned by a polarizing current passed through the coil. After three seconds the current was switched off; the coil was connected automatically for another three seconds to a circuit that amplified the signal generated by the aligned protons precessing in the earth's magnetic field and recorded the precession frequency on a digital counter. The total magnetic intensity was obtained from the relation:

$$H = 23.48738 f$$

where H = total magnetic intensity in gammas (γ)
 f = precession frequency in cycles per second (cps).

Normally readings were made hourly, taking an average of ten separate counts. The results have a possible maximum error of ten γ .

A geological interpretation of these data has been published (Hunkins, ¹² et al, 1962). The tabulated values are given in this report.

Relative changes in the D, Z, and H components were recorded with an Askania variograph. The records are deposited at IGY World Data Center B.

DATE (1959)	TIME (GMT)	TOTAL INTENSITY (GAMMAS)	DATE (1959)	TIME (GMT)	TOTAL INTENSITY (GAMMAS)
09 JUL	0750	56,949	11 JUL	2150	57,377
09	0850	57,077	11	2355	57,260
09	0930	57,144	12	0050	57,031
09	0950	57,168	12	0205	57,183
09	2150	57,542	12	0255	57,230
09	2310	57,365	12	0605	56,966
09	2350	57,371	12	0655	57,048
10	0050	57,266	12	0755	57,037
10	0230	57,119	12	0850	57,048
10	0250	57,254	12	0950	57,048
10	0340	57,019	12	1105	57,090
10	0615	57,025	12	1205	57,154
10	0705	57,113	12	1305	57,148
10	0750	57,131	12	1405	57,225
10	0850	57,283	12	1505	57,371
10	0950	57,465	12	1605	57,360
10	1050	56,890	12	1705	57,377
10	1150	56,960	12	1950	57,348
10	1250	57,031	12	2104	57,289
10	1350	57,054	12	2203	57,554
10	1506	57,025	12	2230	57,225
10	1602	57,054	13	0130	57,090
10	1650	57,054	13	0620	57,048
10	1750	57,007	13	0725	57,048
10	2245	57,330	13	0815	57,090
10	2251	57,307	13	0855	57,013
11	0005	57,295	13	1045	57,066
11	0110	57,266	13	1150	57,136
11	0150	57,195	13	1305	57,254
11	0325	57,142	13	1415	57,260
11	0445	57,107	13	1515	57,260
11	0620	57,090	13	1610	57,307
11	0710	56,937	13	1701	57,354
11	0850	57,072	14	0150	57,290
11	0950	57,119	14	0250	57,348
11	1050	57,142	14	0415	57,390
11	1205	57,125	14	0510	57,313
11	1250	57,190	14	0630	57,336
11	1350	57,318	14	0739	57,324
11	1650	57,283	14	0900	57,277
11	1850	57,213	14	1020	57,430
11	2050	57,512	14	1105	57,436

DATE (1959)	TIME (GMT)	TOTAL INTENSITY (GAMMAS)	DATE (1959)	TIME (GMT)	TOTAL INTENSITY (GAMMAS)
14 JUL	1205	57,483	16 JUL	1510	57,424
14	1255	57,512	16	1610	57,454
14	1350	57,530	16	1640	57,477
14	1500	57,659	16	1730	57,448
14	1550	57,589	16	2230	57,230
14	1650	57,594	16	2345	57,166
14	1800	57,600	17	0115	57,090
14	1900	57,594	17	0305	56,990
14	1930	57,618	17	0510	57,054
14	2030	57,501	17	0615	57,201
14	2100	57,436	17	0725	57,060
14	2200	57,371	17	0800	57,072
14	2355	57,342	17	0858	57,084
15	0105	57,266	17	1000	57,324
15	0205	57,324	17	1100	57,201
15	0320	57,366	17	1200	57,195
15	0450	57,342	17	1330	57,266
15	0530	57,277	17	1500	57,342
15	0650	57,207	17	1600	57,313
15	0805	57,166	17	1700	57,735
15	0855	57,107	17	2151	56,808
15	0955	57,072	17	2350	56,907
15	1055	57,166	18	0204	57,095
15	1150	56,913	18	0305	56,960
15	1305	57,113	18	0450	56,978
15	1355	57,154	18	0603	56,984
15	1500	57,337	18	0701	56,990
15	1550	57,260	18	0758	57,154
15	2230	57,618	18	0900	57,272
15	2350	57,336	18	1000	57,401
16	0050	57,477	18	1100	57,465
16	0150	57,107	18	1200	57,371
16	0340	56,903	18	1300	57,407
16	0605	57,060	18	1400	57,371
16	0700	57,037	18	1500	57,366
16	0805	57,054	18	1600	57,366
16	0905	57,137	18	1705	57,366
16	1005	57,207	18	1750	57,371
16	1105	57,207	18	1900	57,553
16	1205	57,225	18	2055	57,929
16	1305	57,266	18	2155	57,734
16	1405	57,301	18	2355	57,485

DATE (1959)	TIME (GMT)	TOTAL INTENSITY (GAMMAS)	DATE (1959)	TIME (GMT)	TOTAL INTENSITY (GAMMAS)
19 JUL	0050	57,365	21 JUL	1005	57,260
19	0150	57,371	21	1105	57,236
19	0310	57,254	21	1205	57,266
19	0500	57,172	21	1305	57,319
19	0705	57,184	21	1405	57,301
19	0803	57,201	21	1505	57,336
19	0909	57,225	21	1600	57,418
19	1100	57,313	21	1650	57,401
19	1200	57,318	21	1800	57,454
19	1300	57,371	21	1935	57,401
19	1400	57,454	21	2035	57,413
19	1510	57,442	21	2105	57,430
19	1600	57,477	22	0001	57,342
19	1700	57,506	22	0200	57,277
19	1750	57,459	22	0335	57,172
19	1900	57,548	22	0505	57,189
19	2000	57,595	22	0605	57,213
19	2050	57,489	22	0705	57,242
19	2205	57,371	22	0810	57,225
19	2255	57,336	22	0905	57,266
19	2400	57,231	22	1005	57,307
20	0015	57,137	22	1105	57,319
20	0105	57,189	22	1205	57,366
20	0205	57,166	22	1305	57,354
20	0330	57,095	22	1355	57,395
20	0505	57,066	22	1450	57,442
20	0600	57,071	22	1550	57,553
20	0700	57,068	22	1700	57,583
20	0903	57,119	22	1800	57,506
20	1200	57,238	22	1830	57,459
20	1300	57,238	22	1930	57,395
20	1358	57,289	22	2000	57,360
20	1500	57,289	22	2100	57,360
20	1600	57,301	23	0008	57,295
20	1700	57,313	23	0225	57,407
20	1750	57,401	23	0305	57,383
20	2005	57,465	23	0500	57,313
20	2150	57,319	23	0745	57,277
21	0140	57,184	23	0855	57,289
21	0245	57,084	23	0955	57,336
21	0525	57,066	23	1055	57,366
21	0810	57,148	23	1155	57,413

DATE (1959)	TIME (GMT)	TOTAL INTENSITY (GAMMAS)	DATE (1959)	TIME (GMT)	TOTAL INTENSITY (GAMMAS)
23 JUL	1255	57,395	26 JUL	0035	57,256
23	1355	57,407	26	0205	57,250
23	1455	57,413	26	0300	57,256
23	1550	57,418	26	0500	57,127
23	1650	57,430	26	0700	57,191
23	1800	57,430	26	0810	57,332
23	1900	57,448	26	0900	57,297
23	2155	57,471	26	1000	57,250
24	0035	57,330	26	1055	57,291
24	0115	57,313	26	1155	57,344
24	0220	57,277	26	1400	57,420
24	0305	57,277	26	1530	57,491
24	0405	57,319	26	1700	57,479
24	0505	57,277	26	1835	57,538
24	0740	57,295	26	2100	57,638
24	0855	57,324	26	2155	57,649
24	0955	57,366	27	0200	57,411
24	1055	57,407	27	0455	57,307
24	1155	57,454	27	0600	57,226
24	1255	57,471	27	0745	57,266
24	1405	57,512	27	0855	57,295
24	1500	57,589	27	1055	57,400
24	1605	57,589	27	1155	57,397
24	1655	57,571	27	1255	57,391
24	1805	57,818	27	1350	57,417
24	1900	57,771	27	1505	57,376
24	2045	57,712	27	1615	57,335
25	0155	57,156	27	1655	57,335
25	0255	57,238	27	1802	57,379
25	0750	57,291	27	1935	57,423
25	0900	57,320	27	2125	57,359
25	1000	57,444	27	2200	57,315
25	1145	57,385	27	2345	57,385
25	1305	57,391	28	0105	57,382
25	1400	57,391	28	0205	57,382
25	1500	57,432	28	0320	57,142
25	1600	57,461	28	0355	51,218
25	1725	57,514	28	0545	57,183
25	1900	57,585	28	0655	57,074
25	1930	57,714	28	0805	56,995
25	2100	57,643	28	0855	56,965
25	2205	57,473	28	0955	56,907

DATE (1959)	TIME (GMT)	TOTAL INTENSITY • (GAMMAS)	DATE (1959)	TIME (GMT)	TOTAL INTENSITY (GAMMAS)
28 JUL	1155	56,938	31 JUL	1510	57,015
28	1255	56,918	31	1610	57,056
28	1350	56,968	31	1800	57,024
28	1500	57,039	31	1900	57,253
28	1620	57,109	31	2035	57,288
28	1800	57,188	31	2150	57,238
28	1900	57,171	1 AUG	0120	57,230
28	2000	57,115	01	0220	57,225
29	0010	56,954	01	0325	57,101
29	0115	57,071	01	0545	57,037
29	0200	57,109	01	0725	57,049
29	0310	57,027	01	0910	57,090
29	0500	57,048	01	1005	57,119
29	0555	57,065	01	1215	56,978
29	0705	57,036	01	1300	56,966
29	0810	57,080	01	1445	57,049
29	0905	57,065	01	1555	57,119
29	1005	57,059	01	1700	57,119
29	1100	57,083	01	1755	57,119
29	1155	57,218	01	1900	57,113
29	1255	57,188	01	2010	57,080
29	1420	57,197	01	2110	57,115
29	1630	57,230	01	2205	57,150
29	1800	57,250	02	0015	57,186
29	1915	57,315	02	0101	57,238
29	2020	57,291	02	0240	57,133
29	2120	57,247	02	0345	57,273
30	0630	56,692	02	0550	57,153
30	0800	56,616	02	0705	56,980
30	1040	56,522	02	0945	57,297
30	1600	56,572	02	1105	57,335
30	1840	56,696	02	1210	57,212
30	2030	56,578	02	1305	57,191
30	2110	56,584	02	1415	57,276
30	2205	56,569	02	1500	57,364
30	2330	56,557	02	1600	57,394
31	0045	56,546	02	1700	57,394
31	0150	56,546	02	1750	57,394
31	0655	56,927	02	1905	57,549
31	0850	56,939	02	2000	57,450
31	0955	56,965	02	2100	57,379
31	1250	56,974	03	0010	57,353
31	1410	56,983	03	0105	57,417

DATE (1959)	TIME (GMT)	TOTAL INTENSITY (GAMMAS)	DATE (1959)	TIME (GMT)	TOTAL INTENSITY (GAMMAS)
03 AUG	0205	57,406	06 AUG	0455	57,244
03	0505	57,180	06	0655	57,224
03	0600	57,244	06	0755	57,209
03	0745	56,995	06	0855	57,259
03	1120	57,294	06	0955	57,212
03	1215	57,315	06	1105	57,253
03	1345	57,406	06	1250	57,379
03	1500	57,417	06	1400	57,335
03	1625	57,429	06	1640	57,388
03	1745	57,438	06	1840	57,482
03	1935	57,599	06	1930	57,499
03	2030	57,576	06	2055	57,582
03	2345	57,370	06	2340	57,535
04	0045	57,370	07	0040	57,438
04	0145	57,414	07	0315	57,282
04	0305	57,315	07	0445	57,230
04	0450	57,268	07	0745	57,115
04	0645	57,385	07	0850	57,180
04	0725	57,376	07	0955	57,209
04	0820	57,364	07	1100	57,220
04	0905	57,356	07	1200	57,232
04	1010	57,497	07	1350	57,247
04	1200	57,409	07	1630	57,259
04	1330	57,543	07	1825	57,379
04	1420	57,432	07	1925	57,397
04	1600	57,453	07	2000	57,359
04	1725	57,526	07	2335	57,453
04	1830	57,596	08	0045	57,373
04	2130	57,403	08	0150	57,315
04	2220	57,432	08	0330	57,238
05	0450	57,356	08	0505	57,188
05	0850	57,320	08	0730	57,136
05	1000	57,303	08	0850	57,139
05	1305	57,376	08	0955	57,188
05	1400	57,397	08	1055	57,200
05	1515	57,391	08	1205	57,259
05	1715	57,470	08	1300	57,259
05	1830	57,532	08	1630	57,347
05	1925	57,470	08	1900	57,268
05	2020	57,522	08	2105	57,209
06	0130	57,637	08	2200	57,282
06	0255	57,373	09	0030	57,306

DATE (1959)	TIME (GMT)	TOTAL INTENSITY (GAMMAS)	DATE (1959)	TIME (GMT)	TOTAL INTENSITY (GAMMAS)
09 AUG	0205	57,253	12 AUG	0600	57,265
09	0305	57,227	12	0700	57,232
09	0505	57,259	12	0805	57,183
09	0905	57,168	12	0925	57,209
09	1200	57,268	12	1045	57,285
09	1345	57,303	12	1220	57,315
09	1725	57,350	12	1445	57,368
09	1845	57,400	12	1625	57,514
09	2010	57,596	12	1855	57,414
09	2125	57,570	12	2000	57,344
09	2355	57,370	13	0205	57,221
10	0110	57,347	13	0350	57,221
10	0235	57,274	13	0825	57,262
10	0415	57,238	13	0940	57,244
10	0545	57,227	13	1040	57,241
10	0730	57,294	13	1950	57,150
10	0850	57,297	13	2115	57,080
10	1005	57,300	13	2355	57,201
10	1105	57,321	14	0215	57,266
10	1215	57,332	14	0450	57,207
10	1320	57,362	14	0655	56,555
10	1410	57,368	14	0720	56,544
10	1600	57,417	14	0835	56,491
10	1700	57,503	14	1105	57,054
10	1810	57,523	14	1205	56,978
10	1925	57,514	14	2120	57,150
10	2110	57,500	14	2345	57,127
11	0010	57,338	15	0130	57,171
11	0215	57,373	15	0250	57,015
11	0345	57,227	15	0320	57,027
11	0455	57,185	15	0430	57,068
11	0655	57,180	15	0535	56,481
11	0835	57,265	15	0640	56,464
11	1030	57,282	15	0740	56,425
11	1930	57,268	15	0905	56,314
11	2000	57,259	15	1045	56,305
11	2100	57,247	15	1255	56,384
11	2350	57,259	15	1400	56,505
12	0135	57,262	15	1525	56,695
12	0200	57,256	15	1700	56,772
12	0305	57,265	15	1830	56,604
12	0445	57,238	15	2031	56,754

DATE (1959)	TIME (GMT)	TOTAL INTENSITY (GAMMAS)	DATE (1959)	TIME (GMT)	TOTAL INTENSITY (GAMMAS)
15 AUG	2108	56,610	18 AUG	0430	57,103
15	2157	56,678	18	0605	57,103
16	0035	56,860	18	0705	57,103
16	0145	56,751	18	0805	57,004
16	0255	56,681	18	0905	57,027
16	0415	56,710	18	1005	57,074
16	0535	56,807	18	1105	57,100
16	0755	56,845	18	1205	57,130
16	1005	56,842	18	1300	57,144
16	1150	57,109	18	1405	57,186
16	1305	57,144	18	1505	57,329
16	1400	57,438	18	1605	57,297
16	1515	57,502	18	1700	57,268
16	1600	57,388	18	1820	57,253
16	1700	57,238	18	1920	57,259
16	1800	57,318	18	2000	57,282
16	1900	57,602	18	2030	57,338
16	2000	57,975	18	2150	57,115
17	0015	57,532	19	0110	57,037
17	0100	57,388	19	0210	56,921
17	0225	57,250	19	0305	56,936
17	0435	57,056	19	0505	56,866
17	0540	56,437	19	0640	56,804
17	0640	56,372	19	0750	56,748
17	0740	56,378	19	0940	56,800
17	0800	56,942	19	1150	56,918
17	0910	56,998	19	1305	56,904
17	1000	57,115	19	1405	56,904
17	1200	57,165	19	1505	56,912
17	1300	57,156	19	1600	57,024
17	1400	57,268	19	1700	57,009
17	1525	57,321	19	1835	57,056
17	1615	57,277	19	1930	57,083
17	1810	57,279	19	2030	57,106
17	1920	57,233	19	2145	56,983
17	2000	57,391	19	2355	56,983
17	2100	57,415	20	0430	56,866
17	2330	57,356	20	0705	56,954
18	0030	57,291	20	0945	57,185
18	0155	57,262	20	1055	57,153
18	0305	57,174	20	1205	57,106

DATE (1959)	TIME (GMT)	TOTAL INTENSITY (GAMMAS)	DATE (1959)	TIME (GMT)	TOTAL INTENSITY (GAMMAS)
20 AUG	1300	57,147	23 AUG	0750	56,731
20	1415	57,191	23	0905	56,722
20	1500	57,203	23	1040	57,030
20	1600	57,147	23	1315	57,100
20	1720	57,165	23	1400	57,177
20	1830	57,092	23	1455	57,268
20	1920	57,077	23	1645	57,323
20	2025	57,059	23	1915	57,574
20	2200	57,051	23	2000	57,511
21	0000	56,907	23	2100	57,453
21	0255	56,830	23	2200	57,605
21	0450	56,910	23	2355	57,388
21	0640	56,951	24	0230	57,174
21	0805	56,951	24	0355	57,092
21	0915	56,986	24	0910	57,136
21	1040	57,045	24	1010	57,103
21	1135	57,080	24	1105	57,203
21	1300	57,095	24	1205	57,233
21	1500	57,144	24	1305	57,203
21	1615	57,156	24	1630	57,159
21	1730	57,191	24	1930	57,009
21	2000	57,291	24	2100	56,939
21	2100	57,288	24	2350	56,775
21	2200	57,288	25	0205	56,742
21	2350	57,106	25	0745	56,657
22	0205	56,951	25	0955	56,704
22	0300	56,945	25	1245	56,822
22	0430	56,948	25	1430	56,849
22	0540	56,880	25	1715	56,984
22	0730	56,898	25	1835	56,931
22	0850	56,871	25	2020	56,867
22	1005	56,965	25	2200	56,861
22	1205	57,012	26	0010	56,814
22	1805	57,153	26	0200	56,843
22	1912	57,150	26	0325	56,867
22	2100	57,162	26	0525	56,861
22	2200	57,103	29	1325	56,895
22	2350	56,995	29	1600	56,971
23	0200	56,866	29	1720	57,042
23	0300	56,854	29	1920	57,106
23	0425	56,936	29	2340	57,159
23	0535	56,910	30	0125	56,951

DATE (1959)	TIME (GMT)	TOTAL INTENSITY (GAMMAS)	DATE (1959)	TIME (GMT)	TOTAL INTENSITY (GAMMAS)
30 AUG	0240	56,942	02 SEP	0105	57,831
30	0415	56,954	02	0250	57,529
30	0630	56,951	02	0445	57,450
30	0825	56,974	02	0750	57,426
30	1025	56,930	02	0850	57,535
30	1205	56,998	02	1015	57,367
30	1310	57,083	02	1130	57,303
30	1600	57,009	02	1235	57,250
30	1750	57,206	02	1435	57,206
30	2000	57,177	02	1710	57,235
30	2150	57,127	02	2345	57,306
31	0040	57,514	03	0230	57,144
31	0140	57,585	03	0525	56,995
31	0250	57,552	03	0805	56,918
31	0430	57,588	03	1205	56,990
31	0805	57,872	03	1345	57,043
31	1005	57,919	03	1535	57,054
31	1150	58,010	03	1750	57,078
31	1310	58,043	03	1945	57,330
31	1425	58,125	03	2200	57,166
31	1600	58,186	03	2345	56,972
31	1745	58,248	04	0100	57,148
31	1905	58,292	04	0200	56,849
31	2057	58,377	04	0315	56,814
01 SEP	0040	58,345	04	0525	56,890
01	0115	58,183	04	0730	56,931
01	0250	58,207	04	0835	57,025
01	0450	58,125	04	0955	57,142
01	0550	58,075	04	1110	57,148
01	0810	58,022	04	1240	57,282
01	0905	58,039	04	1340	57,253
01	1020	58,116	04	1600	57,594
01	1130	58,172	04	1740	57,567
01	1245	58,157	04	1920	57,461
01	1345	58,139	04	2330	57,530
01	1445	58,128	05	0145	57,465
01	1635	58,201	05	0245	57,436
01	1805	58,248	05	0445	57,436
01	1900	58,175	05	0600	57,448
01	2045	58,222	05	0750	57,450
01	2155	58,207	05	0900	57,500
01	2400	57,828	05	1055	57,441

DATE (1959)	TIME (GMT)	TOTAL INTENSITY (GAMMAS)	DATE (1959)	TIME (GMT)	TOTAL INTENSITY (GAMMAS)
05 SEP	1450	57,542	08	1230	57,289
05	1600	57,536	08	1610	57,307
05	1730	57,530	08	1825	57,336
05	1900	57,536	08	2100	57,342
05	2040	57,624	08	2335	57,225
06	0050	57,301	09	0050	57,236
06	0220	57,283	09	0205	57,236
06	0330	57,250	09	0340	57,219
06	0450	57,244	09	0455	57,248
06	0530	57,262	09	0630	57,260
06	0655	57,274	09	0745	57,260
06	0805	57,306	09	1045	57,248
06	0910	57,344	09	1205	57,272
06	1010	57,373	09	1405	57,283
06	1150	57,412	09	1515	57,301
06	1315	57,438	09	1605	57,348
06	1445	57,489	09	1800	57,326
06	1630	57,459	09	1915	57,313
06	1805	57,418	09	2038	57,313
06	1930	57,394	09	2130	57,313
06	2145	57,401	09	2355	57,289
06	2335	57,366	10	0120	57,319
07	0100	57,354	10	0255	57,336
07	0205	57,348	10	0450	57,360
07	0355	57,348	10	0640	57,354
07	0515	57,342	10	0745	57,371
07	0755	57,330	10	0855	57,383
07	0945	57,324	10	0955	57,388
07	1115	57,313	10	1055	57,388
07	1225	57,319	10	1155	57,388
07	1445	57,313	10	1255	57,407
07	1535	57,313	10	1355	57,419
07	1730	57,395	10	1455	57,425
07	1920	57,395	10	1615	57,448
07	2020	57,354	10	1735	57,454
07	2100	57,401	10	1855	57,477
08	0240	57,295	10	2015	57,489
08	0445	57,242	10	2145	57,495
08	0620	57,254	11	0150	57,471
08	0755	57,213	11	0306	57,442
08	0930	57,236	11	0450	57,377
08	1050	57,307	11	0650	57,413

DATE (1959)	TIME (GMT)	TOTAL INTENSITY (GAMMAS)	DATE (1959)	TIME (GMT)	TOTAL INTENSITY (GAMMAS)
11 SEP	0900	57,471	14 SEP	1030	56,802
11	1010	57,495	14	1155	56,908
11	1210	57,536	14	1315	56,908
11	1630	57,489	14	1430	56,955
11	1845	57,477	14	1540	57,060
11	2130	57,454	14	1655	57,025
11	2350	57,430	14	1745	57,019
12	0135	57,307	14	1930	56,984
12	0350	57,336	14	2045	56,919
12	0455	57,348	15	0235	56,802
12	0615	57,360	15	0500	56,820
12	0810	57,366	15	0650	56,761
12	1035	57,342	15	0755	56,761
12	1205	57,342	15	0807	56,767
12	1315	57,313	15	0937	56,761
12	1410	57,295	15	1140	56,737
12	1545	57,342	15	1240	56,743
12	1715	57,495	15	1430	56,737
12	1800	57,483	15	1600	56,761
12	1920	57,530	15	1800	56,843
12	2035	57,477	15	1925	56,843
12	2320	57,565	15	2025	56,884
13	0040	57,659	15	2150	56,737
13	0200	57,718	15	2345	56,643
13	0500	57,788	16	0105	56,591
13	0635	57,747	16	0525	56,573
13	0830	57,641	16	0650	56,585
13	1010	57,600	16	0810	56,632
13	1050	57,577	16	1005	56,673
13	1330	57,495	16	1250	56,696
13	1520	57,454	16	1415	56,708
13	1720	57,325	16	1525	56,749
13	1910	57,066	16	1655	56,825
13	2000	56,996	16	1800	56,831
13	2125	56,925	16	1910	56,861
13	2345	56,690	16	2055	56,778
14	0215	56,556	16	2150	56,790
14	0400	56,590	16	2400	56,767
14	0520	56,632	17	0250	56,825
14	0635	56,626	17	0525	56,755
14	0745	56,708	17	0805	56,814
14	0905	56,767	17	1005	56,867

DATE (1959)	TIME (GMT)	TOTAL INTENSITY (GAMMAS)	DATE (1959)	TIME (GMT)	TOTAL INTENSITY (GAMMAS)
17 SEP	1215	56,966	20 SEP	1310	57,730
17	1430	56,984	20	1445	57,759
17	1610	57,090	20	1555	57,647
17	1730	57,066	20	1655	57,583
17	1920	57,090	20	1810	57,718
17	2115	57,342	20	1945	57,700
17	2345	57,266	20	2150	57,600
18	0055	57,242	20	2345	57,424
18	0250	57,295	21	0145	57,336
18	0520	57,407	21	0330	57,295
18	0645	57,418	21	0455	57,242
18	0805	57,436	21	0630	57,231
18	1000	57,454	21	0755	57,225
18	1155	57,577	21	1005	57,295
18	1415	57,718	21	1155	57,330
18	1640	57,912	21	1350	57,477
18	1840	58,058	21	1555	57,371
18	2045	58,193	21	1730	57,371
18	2225	58,041	21	1905	57,330
19	0007	58,029	21	2035	57,319
19	0055	57,976	21	0450	57,137
19	0155	57,923	21	0610	57,137
19	0320	57,771	21	0845	57,166
19	0450	57,747	21	1100	57,225
19	0615	57,706	21	1220	57,307
19	0750	57,800	21	1310	57,272
19	0905	57,812	21	1435	57,401
19	1145	57,835	21	1600	57,401
19	1335	57,853	21	1700	57,407
19	1540	57,876	21	1910	57,313
19	1625	57,870	21	2200	57,213
19	1820	57,882	23	0015	57,207
19	2010	57,894	23	0150	57,184
19	2130	57,900	23	0505	57,148
19	2340	57,882	23	0630	57,137
20	0220	57,888	23	0755	57,184
20	0315	57,882	23	0955	57,184
20	0530	57,694	23	1150	57,254
20	0710	57,647	23	1305	57,371
20	0755	57,665	23	1640	57,442
20	1030	57,706	23	1750	57,424
20	1205	57,771	24	0040	57,360

DATE (1959)	TIME (GMT)	TOTAL INTENSITY (GAMMAS)	DATE (1959)	TIME (GMT)	TOTAL INTENSITY (GAMMAS)
24 SEP	0210	57,248	27 SEP	1245	57,818
24	0520	57,201	27	1650	57,888
24	0715	57,254	27	1835	57,917
24	0920	57,201	27	2225	57,917
24	1150	57,448	28	0105	57,806
24	1355	57,735	28	0231	57,800
24	1530	57,659	28	0306	57,812
24	1655	57,730	28	0505	57,735
24	1840	57,718	28	0815	57,753
24	2020	57,677	28	1005	57,747
24	2120	57,653	28	1145	57,712
24	2340	57,653	28	1325	57,694
25	0055	57,559	28	1600	57,630
25	0305	57,430	28	1700	57,565
25	0725	57,336	28	1925	57,700
25	0855	57,342	28	2130	57,495
25	1145	57,424	28	2320	57,459
25	1205	57,377	29	0145	57,377
25	1800	57,700	29	0325	57,365
25	1920	57,665	29	0525	57,418
25	2025	57,624	29	0725	57,412
25	2130	57,606	29	0845	57,477
25	2335	57,542	29	1040	57,530
26	0105	57,459	29	1220	57,588
26	0255	57,477	29	1340	57,735
26	0520	57,518	29	1540	57,688
26	0630	57,565	29	1655	57,688
26	0810	57,389	29	1805	57,677
26	1010	57,659	29	1950	57,600
26	1225	57,870	29	2050	57,571
26	1525	57,788	29	2340	57,565
26	1700	57,777	30	0110	57,577
26	1830	57,894	30	0300	57,618
26	2050	57,912	30	0520	57,606
26	2305	57,823	30	0750	57,571
27	0035	57,723	30	0915	57,577
27	0200	57,583	30	1045	57,606
27	0302	57,683	30	1210	57,653
27	0550	57,618	30	1350	57,812
27	0805	57,577	30	1740	57,964
27	0905	57,595	30	1910	57,976
27	1115	57,958	30	2150	57,976

DATE (1959)	TIME (GMT)	TOTAL INTENSITY (GAMMAS)	DATE (1959)	TIME (GMT)	TOTAL INTENSITY (GAMMAS)
01 OCT	0005	57,823	06 OCT	0545	57,876
01	0145	57,759	06	0855	57,577
01	0330	57,624	06	1015	57,730
01	0525	57,553	06	1600	57,865
01	0715	57,501	06	1905	57,876
01	0855	57,483	06	2040	57,818
01	1125	57,553	06	2240	57,771
01	1340	57,671	06	2335	57,688
01	1605	57,800	07	0235	57,759
01	1745	57,800	07	0503	57,706
01	1920	57,805	07	0603	57,706
01	2100	57,795	07	0730	57,711
01	2325	57,800	07	1505	58,047
02	0120	57,289	07	1846	58,334
02	0300	57,829	07	2145	58,416
02	0525	57,753	07	2356	58,369
02	0730	57,688	08	0308	58,170
02	0930	57,700	08	0505	57,859
02	1115	57,767	08	0705	57,688
02	1255	57,847	08	0905	57,606
02	1435	57,900	08	1008	57,636
03	0410	58,023	08	1105	57,595
03	0600	57,994	08	1557	57,730
03	0755	58,035	09	0600	57,688
03	1005	57,917	09	0700	57,671
03	1130	57,859	09	0805	57,660
03	1355	57,888	09	0902	57,641
04	0549	57,823	09	1005	57,630
04	0755	57,747	09	1605	57,694
04	0905	57,794	10	0206	57,765
04	1040	57,788	10	0405	57,724
04	1145	57,847	10	0503	57,718
04	1430	58,035	10	0703	57,618
04	1520	57,923	10	0805	57,577
05	0230	57,600	10	0903	57,548
05	0445	57,542	10	1000	57,536
05	0550	57,524			
05	0815	57,630	11	0437	57,465
05	0940	57,688	11	0555	57,471
05	1055	57,735	11	0703	57,483
05	1550	58,047	11	0805	57,501
06	0050	58,176	11	0905	57,524

DATE (1959)	TIME (GMT)	TOTAL INTENSITY (GAMMAS)	DATE (1959)	TIME (GMT)	TOTAL INTENSITY (GAMMAS)
11 OCT	1105	57,565	17 OCT	1004	57,436
12	0808	57,823	17	1107	57,495
12	0908	57,829	17	1605	57,436
12	1006	57,829	17	1802	57,471
12	1104	57,835	17	1901	57,418
12	1604	57,859	17	2003	57,448
12	1700	57,870	17	2104	57,471
12	1759	57,865	18	0304	57,295
12	1902	57,865	18	0502	57,289
12	2058	57,964	18	0705	57,342
13	0002	57,800	18	0800	57,360
13	0302	57,800	18	0900	57,377
13	0802	57,759	18	1604	57,501
13	0902	57,759	18	1801	57,547
13	1010	57,759	19	0004	57,501
13	1727	57,653	19	0103	57,524
14	1000	57,495	19	0304	57,471
14	1100	57,489	19	0504	57,488
14	1615	57,436	19	0703	57,506
15	0320	57,242	19	0803	57,548
15	0403	57,184	19	0958	57,606
15	0540	57,189	19	1103	57,653
15	0705	57,213	19	1609	57,677
15	0902	57,207	19	1803	57,698
15	1002	57,207	19	1903	57,724
15	1103	57,219	19	2303	57,671
15	1603	57,266	20	0103	57,641
15	1737	57,266	20	0301	57,641
16	0046	57,231	20	0603	57,589
16	0205	57,248	20	0703	57,589
16	0502	57,313	20	0803	57,495
16	0622	57,283	20	0950	57,459
16	0705	57,283	20	1103	57,536
16	1003	57,307	20	1556	57,448
16	1103	57,307	20	1757	57,413
16	1618	57,360	20	1958	57,371
16	1838	57,377	20	2106	57,348
17	0203	57,389	20	2321	57,301
17	0303	57,395	21	0016	57,289
17	0503	57,389	21	0207	57,283
17	0703	57,401	21	0303	57,283
17	0906	57,413	21	0402	57,283

DATE (1959)	TIME (GMT)	TOTAL INTENSITY (GAMMAS)	DATE (1959)	TIME (GMT)	TOTAL INTENSITY (GAMMAS)
21 OCT	0555	57,272	24 OCT	1103	57,007
21	0655	57,272	24	1557	57,078
21	0758	57,231	24	1900	57,148
21	0859	57,201	25	0130	57,454
21	1000	57,178	25	0500	57,336
21	1057	57,166	25	0800	57,330
21	1200	57,166	25	0900	57,307
21	1540	57,272	25	1000	57,316
21	1701	57,319	25	1058	57,495
21	1802	57,342	25	1904	57,418
21	1905	57,389	25	2005	57,383
21	2000	57,377	25	2400	57,383
22	0055	57,377	26	0105	57,395
22	0200	57,377	26	0205	57,371
22	0300	57,389	26	0258	57,395
22	0457	57,354	26	0503	57,366
22	0558	57,366	26	0555	57,377
22	0658	57,377	26	0657	57,383
22	0754	57,260	26	0759	57,383
22	0856	57,377	26	1100	57,442
22	1003	57,465	26	1203	57,495
22	1100	57,477	26	1803	57,630
22	1551	57,706	26	1959	57,612
22	1703	57,853	26	2203	57,448
22	1803	57,777	27	0208	57,313
22	1903	57,730	27	0258	57,336
23	0100	57,413	27	0555	57,254
23	0500	57,342	27	0700	57,236
23	0557	57,366	27	0753	57,254
23	0800	57,360	27	0905	57,295
23	0857	57,360	27	1000	57,301
23	0955	57,360	27	1658	57,371
23	1103	57,436	27	1900	57,354
23	1659	57,342	27	2101	57,307
23	1859	57,330	27	2201	57,307
24	0002	57,208	28	0206	57,324
24	0202	57,184	28	0404	57,342
24	0557	57,125	28	0457	57,348
24	0656	57,095	28	0556	57,319
24	0757	57,054	28	0658	57,313
24	0859	57,066	28	0757	57,319
24	1005	57,019	28	1100	57,348
			28	1203	57,371

DATE (1959)	TIME (GMT)	TOTAL INTENSITY (GAMMAS)	DATE (1959)	TIME (GMT)	TOTAL INTENSITY (GAMMAS)
28 OCT	1603	57,424	01 NOV	0214	57,612
28	1812	57,430	01	0315	57,630
28	2000	57,430	01	0457	57,665
28	2202	57,418	01	0553	57,688
28	2400	57,413	01	0658	57,688
29	0202	57,424	01	0758	57,706
29	0303	57,436	01	1103	57,888
29	0454	57,430	01	1900	58,017
29	0555	57,401	01	1958	57,953
29	0803	57,395	01	2100	57,988
29	0857	57,401	01	2202	57,959
29	1000	57,436	01	2303	57,888
29	1054	57,459	01	2400	57,847
29	1159	57,477	02	0102	57,800
29	1556	57,606	02	0203	57,806
29	1657	57,559	02	0304	57,765
29	1902	57,530	02	0502	57,730
29	2007	57,512	02	0606	57,718
30	0055	57,524	02	0802	57,777
30	0155	57,471	02	0900	57,829
30	0300	57,418	02	1058	57,917
30	0458	57,454	02	1203	57,935
30	0559	57,483	03	0556	57,724
30	0804	57,501	03	0752	57,759
30	0858	57,506	03	0856	57,841
30	1003	57,501	03	1002	57,835
30	1103	57,489	03	1103	57,753
30	1204	57,489	03	1309	57,859
30	1602	57,465	03	1756	58,017
30	1807	57,512	03	1858	58,152
30	1902	57,518	03	1959	58,129
31	0500	57,430	03	2100	57,994
31	0700	57,418	03	2257	57,900
31	0800	57,418	04	0003	57,835
31	0910	57,424	04	0100	57,777
31	1000	57,448	04	0306	57,777
31	1103	57,465	04	0703	57,724
31	1708	57,724	04	0900	57,759
31	1908	57,782	04	1103	57,759
31	2108	57,724	04	1203	57,818
31	2302	57,694	04	1317	57,865
01 NOV	0008	57,647	4	1600	57,829

DATE (1959)	TIME (GMT)	TOTAL INTENSITY (GAMMAS)	DATE (1959)	TIME (GMT)	TOTAL INTENSITY (GAMMAS)
04 NOV	1716	58,005	10 NOV	0656	57,624
04	1804	57,923	10	0757	57,630
04	1927	57,847	10	0903	57,641
04	2109	57,853	10	0958	57,647
05	1122	57,947	10	1101	57,647
05	1601	57,988	10	1157	57,665
08	1223	57,800	10	1302	57,741
08	1255	57,782	10	1403	57,718
08	1921	57,853	10	1552	57,683
08	2004	57,829	10	1700	57,694
08	2110	57,747	10	1807	57,683
08	2203	57,718	10	1900	57,653
08	2302	57,688	10	2005	57,612
08	2400	57,683	10	2100	57,583
09	0104	57,677	10	2205	57,565
09	0158	57,665	10	2308	57,489
09	0256	57,647	11	0456	57,354
09	0406	57,583	11	0806	57,336
09	0455	57,571	11	1006	57,413
09	0557	57,548	11	1103	57,395
09	0658	57,518	11	1203	57,413
09	0757	57,489	11	1305	57,413
09	0954	57,454	11	1359	57,413
09	1058	57,442	11	1552	57,407
09	1158	57,436	11	1720	57,395
09	1304	57,436	11	1805	57,407
09	1354	57,430	11	1902	57,401
09	1602	57,477	11	2000	57,395
09	1653	57,501	11	2100	57,389
09	1753	57,501	11	2200	57,366
09	1814	57,571	11	2300	57,371
09	1903	57,577	12	0005	57,354
09	2000	57,618	12	0100	57,336
09	2100	57,577	12	0200	57,336
09	2207	57,559	12	0300	57,324
			12	0555	57,295
10	0012	57,506	12	0800	57,277
10	0103	57,524	12	0900	57,277
10	0206	57,548	12	1000	57,272
10	0308	57,600	12	1057	57,272
10	0501	57,636	12	1156	57,283
10	0603	57,636	12	1256	57,295

DATE (1959)	TIME (GMT)	TOTAL INTENSITY (GAMMAS)	DATE (1959)	TIME (GMT)	TOTAL INTENSITY (GAMMAS)
12 NOV	1356	57,301	14 NOV	1857	57,583
12	1554	57,324	14	1958	57,518
12	1658	57,354	15	0300	57,407
12	1759	57,389	15	0400	57,413
12	1900	57,424	15	0452	57,401
12	2000	57,401	15	0602	57,383
12	2100	57,389	15	1159	57,424
12	2221	57,389	15	1359	57,342
12	2309	57,371	15	1856	57,301
12	2400	57,371	15	2000	57,283
13	0100	57,389	15	2058	57,277
13	0200	57,407	15	2200	57,254
13	0300	57,424	15	2300	57,248
13	0500	57,430	15	2400	57,248
13	0603	57,401	16	0100	57,248
13	0657	57,413	16	0220	57,248
13	0800	57,418	16	0300	57,248
13	0900	57,418	16	0400	57,248
13	1000	57,407	16	0456	57,248
13	1058	57,465	16	0725	57,236
13	1203	57,436	16	0800	57,225
13	1359	57,424	16	0858	57,213
13	1559	57,442	16	1103	57,219
13	1658	57,448	16	1158	57,225
13	1759	57,454	16	1257	57,225
13	1900	57,454	16	1358	57,236
13	2000	57,442	16	1957	57,465
13	2100	57,465	16	2100	57,430
13	2200	57,471	16	2200	57,413
13	2325	57,424	16	2300	57,301
13	2400	57,395	16	2400	57,254
14	0115	57,354	16	0100	57,242
14	0157	57,348	17	0950	57,371
14	0457	57,313	18	1055	57,301
14	0558	57,324	18	1305	57,413
14	0659	57,336	18	1359	57,418
14	0852	57,354	18	1800	57,471
14	1205	57,454	18	1900	57,577
14	1258	57,606	18	2000	57,553
14	1359	57,647	18	2100	57,430
14	1656	57,577	18	2200	57,418
14	1758	57,618	19	0020	57,336

DATE (1959)	TIME (GMT)	TOTAL INTENSITY (GAMMAS)	DATE (1959)	TIME (GMT)	TOTAL INTENSITY (GAMMAS)
19 NOV	0115	57,330	21 NOV	0200	57,148
19	0200	57,336	21	0310	57,160
19	0300	57,313	21	0456	57,148
19	0400	57,330	21	0557	57,148
19	0500	57,324	21	0718	57,178
19	0759	57,348	21	0801	57,195
19	0905	57,371	21	1009	57,225
19	0957	57,418	21	1059	57,248
19	1050	57,471	21	1200	57,395
19	1154	57,578	21	1259	57,360
19	1325	57,506	21	1402	57,448
19	1358	57,501	21	1700	57,360
19	1700	57,524	21	1800	57,330
19	1800	57,459	21	2025	57,383
19	1900	57,407	21	2100	57,377
19	2000	57,413	21	2201	57,307
19	2100	57,366	21	2306	57,248
19	2200	57,342	22	0100	57,189
19	2300	57,324	22	0300	57,160
19	2400	57,313	22	0405	57,125
20	0100	57,319	22	0502	57,154
20	0200	57,301	22	0600	57,154
20	0221	57,289	22	0700	57,166
20	0300	57,295	22	0800	57,166
20	0455	57,272	22	0900	57,166
20	0600	57,260	22	1003	57,178
20	0800	57,248	22	1104	57,189
20	1000	57,254	22	1159	57,413
20	1100	57,225	22	1345	57,336
20	1200	57,219	22	1658	57,225
20	1258	57,231	22	1800	57,254
20	1358	57,231	22	1903	57,242
20	1630	57,225	22	2000	57,242
20	1700	57,219	22	2100	57,242
20	1800	57,225	22	2200	57,207
20	1900	57,231	22	2400	57,189
20	2000	57,213	23	0100	57,178
20	2100	57,201	23	0200	57,178
20	2200	57,184	23	0300	57,172
20	2310	57,148	23	0400	57,172
20	2400	57,142	23	0500	57,154
21	0115	57,142	23	0705	57,172

DATE (1959)	TIME (GMT)	TOTAL INTENSITY (GAMMAS)
23 NOV	0756	57,201
23	0859	57,184
23	0958	57,189
23	1059	57,436
23	1152	57,319
23	1301	57,301
23	1404	57,383
23	1502	57,512
23	1657	57,407
23	1758	57,371
23	1858	57,319
23	1957	57,289
23	2057	57,236
23	2157	57,178
23	2300	57,142
23	2400	57,154
24	0100	57,160
24	0200	57,166
24	0304	57,154
24	0406	57,148
24	0451	57,131
24	0601	57,154
24	0700	57,148
24	0752	57,137
24	0858	57,154
24	1002	57,154
24	1057	57,160
24	1151	57,166
24	1300	57,178
24	1355	57,266
24	1457	57,395
24	1558	57,301
24	1658	57,277
24	1858	57,254
24	1959	57,283
24	2100	57,248
24	2155	57,236
24	2258	57,219
24	2400	57,207
25	0100	57,236
25	0200	57,242
25	0300	57,236

DATE (1959)	TIME (GMT)	TOTAL INTENSITY (GAMMAS)
25 NOV	0412	57,231
25	0459	57,236
25	0604	57,231
25	0700	57,236
25	0800	57,254
25	0857	57,266
25	0957	57,324
25	1057	57,307
25	1302	57,407
25	1402	57,377
25	1505	57,383
25	1657	57,371
25	1757	57,395
25	1857	57,436
25	1957	57,424
25	2057	57,407
25	2156	57,383
25	2305	57,342
25	2400	57,301
26	0100	57,272
26	0200	57,272
26	0300	57,236
26	0400	57,219
26	0455	57,219
26	0609	57,248
26	0710	57,254
26	0805	57,254
26	0900	57,236
26	0957	57,266
26	1101	57,442
26	1149	57,366
26	1258	57,366
26	1400	57,366
26	1506	57,313
26	1557	57,307
26	1700	57,319
26	1759	57,336
26	1857	57,330
26	2001	57,336
26	2102	57,371
26	2200	57,366
26	2255	57,407

DATE (1959)	TIME (GMT)	TOTAL INTENSITY (GAMMAS)	DATE (1959)	TIME (GMT)	TOTAL INTENSITY (GAMMAS)
27 NOV	0025	57,389	28 NOV	2400	57,677
27	0100	57,354	29	0059	57,641
27	0200	57,360	29	0200	57,612
27	0300	57,371	29	0240	57,595
27	0410	57,366	29	0459	57,606
27	0500	57,389	29	0557	57,606
27	0705	57,407	29	0720	57,600
27	0815	57,442	29	0800	57,595
27	0902	57,448	29	0903	57,595
27	0959	57,471	29	0956	57,595
27	1102	57,495	29	1103	57,600
27	1158	57,254	29	1201	57,542
27	1259	57,553	29	1303	57,636
27	1401	57,595	29	1405	57,677
27	1456	57,606	29	1502	57,794
27	1707	57,624	29	1600	57,782
27	1800	57,641	29	1659	57,724
27	1857	57,647	29	1756	57,665
27	1957	57,712	29	1905	57,700
27	2057	57,700	29	2000	57,665
27	2200	57,665	29	2100	57,600
27	2259	57,639	29	2200	57,606
27	2359	57,577	29	2300	57,565
28	0110	57,595	29	2400	57,536
28	0200	57,524	30	0100	57,524
28	0256	57,542	30	0200	57,506
28	0400	57,577	30	0300	57,512
28	0459	57,595	30	0430	57,512
28	0617	57,571	30	0511	57,518
28	0658	57,565	30	0625	57,465
28	0800	57,553	30	0703	57,506
28	0856	57,548	30	0800	57,501
28	0959	57,606	30	0906	57,319
28	1054	57,730	30	0958	57,501
28	1147	57,618	30	1059	57,583
28	1304	57,718	30	1200	57,530
28	1401	57,706	30	1306	57,688
28	1459	57,712	30	1400	57,700
28	2000	57,700	30	1456	57,777
28	2100	57,741	30	1559	57,912
28	2200	57,706	30	1658	57,900
28	2300	57,753	30	1759	57,870

DATE (1959)	TIME (GMT)	TOTAL INTENSITY (GAMMAS)	DATE (1959)	TIME (GMT)	TOTAL INTENSITY (GAMMAS)
30 NOV	1857	57,812	02 DEC	1757	58,029
30	1958	57,777	02	1858	57,982
30	2058	57,794	02	1957	58,058
30	2200	57,782	02	2300	57,894
30	2300	57,712	02	2400	57,859
30	2400	57,671	03	0100	57,800
01 DEC	0100	57,706	03	0200	57,735
01	0200	57,700	03	0300	57,700
01	0300	57,647	03	0400	57,683
01	0410	57,665	03	0457	57,724
01	0500	57,665	03	0559	57,741
01	0555	57,665	03	0658	57,788
01	0600	57,683	03	0757	57,876
01	0800	57,595	03	0859	57,970
01	0859	57,595	03	0958	57,900
01	0959	57,782	03	1105	57,152
01	1058	57,788	03	1202	58,141
01	1200	57,777	03	1256	58,270
01	1314	57,812	03	1405	58,287
01	1357	57,906	03	1503	57,759
01	1501	57,812	03	1700	58,276
01	1707	57,912	03	1756	58,234
01	1800	57,823	03	1901	58,234
01	1857	57,806	03	2010	58,281
01	1958	57,841	03	2100	58,311
01	2059	57,818	03	2157	58,317
01	2400	57,788	03	2300	58,428
02	0100	57,800	03	2400	58,375
02	0200	57,794	04	0120	58,340
02	0300	57,782	04	0201	58,317
02	0400	57,806	04	0300	58,281
02	0457	57,812	04	0400	58,281
02	0602	57,818	04	0502	58,299
02	0705	57,806	04	0602	58,293
02	0756	57,847	04	0703	58,299
02	0857	57,912	04	0800	58,293
02	1011	57,794	04	0902	58,299
02	1100	57,495	04	0958	58,199
02	1258	58,005	04	1101	58,158
02	1502	58,129	04	1159	58,123
02	1559	58,158	04	1256	58,164
02	1657	58,058	04	1405	57,706

DATE (1959)	TIME (GMT)	TOTAL INTENSITY (GAMMAS)	DATE (1959)	TIME (GMT)	TOTAL INTENSITY (GAMMAS)
04 DEC	1501	57,970	06 DEC	1059	57,342
04	1559	57,906	06	1201	57,348
04	1709	57,853	06	1400	57,413
04	1758	57,841	06	1458	57,442
04	1859	57,841	06	1558	57,477
04	1959	57,782	06	1918	57,559
04	2057	57,718	06	1958	57,571
04	2157	57,659	06	2058	57,559
04	2300	57,589	06	2200	57,477
04	2400	57,542	06	2256	57,501
05	0100	57,524	07	0002	57,524
05	0200	57,506	07	0104	57,559
05	0300	57,483	07	0200	57,571
05	0415	57,454	07	0300	57,659
05	0459	57,442	07	0410	57,671
05	0601	57,424	07	0500	57,694
05	0700	57,407	07	0600	57,700
05	0803	57,342	07	0703	57,700
05	0904	57,395	07	0805	57,694
05	0959	57,324	07	0904	57,677
05	1100	57,371	07	0959	57,665
05	1202	57,383	07	1100	57,630
05	1305	57,506	07	1158	57,606
05	1358	57,588	07	1300	57,571
05	1502	57,600	07	1400	57,571
05	1558	57,841	07	1505	57,612
05	1657	57,806	07	1600	57,647
05	1757	57,636	07	1710	57,559
05	1858	57,700	07	1757	57,524
05	2056	57,647	07	1857	57,530
05	2157	57,706	07	1959	57,536
05	2300	57,612	07	2058	57,536
06	0020	57,530	07	2200	57,536
06	0100	57,506	07	2300	57,559
06	0300	57,436	07	2400	57,565
06	0400	57,395	08	0703	57,553
06	0500	57,413	08	0800	57,501
06	0620	57,401	08	1000	57,401
06	0659	57,383	08	1106	57,424
06	0800	57,377	08	1159	57,354
06	0900	57,377	08	1358	57,295
06	1003	57,324	08	1458	57,272

DATE (1959)	TIME (GMT)	TOTAL INTENSITY (GAMMAS)	DATE (1959)	TIME (GMT)	TOTAL INTENSITY (GAMMAS)
08 DEC	1558	57,248	10 DEC	2147	57,583
08	1658	57,231	10	2220	57,577
08	1823	57,248	10	2300	57,583
08	1857	57,225	10	2400	57,583
08	2400	57,242	11	0100	57,577
09	0100	57,236	11	0200	57,577
03	0159	57,242	11	0305	57,577
09	0300	57,277	11	0400	57,588
09	0400	57,313	11	0505	57,536
09	0759	57,360	11	0557	57,536
09	0902	57,389	11	0800	57,542
09	0956	57,418	11	0900	57,548
09	1057	57,430	11	0959	57,524
09	1159	57,448	11	1057	57,530
09	1359	57,512	11	1200	57,530
09	1502	57,530	11	1259	57,536
09	1559	57,553	11	1505	57,542
09	1657	57,536	11	1558	57,536
09	1800	57,548	11	1800	57,548
09	1900	57,553	11	1908	57,536
09	2400	57,542	11	2000	57,524
10	0100	57,553	11	2100	57,506
10	0200	57,559	11	2200	57,483
10	0300	57,559	11	2300	57,471
10	0405	57,565	12	0500	57,477
10	0512	57,559	12	0600	57,418
10	0600	57,571	12	0702	57,436
10	0657	57,559	12	0800	57,459
10	0759	57,565	12	0859	57,471
10	0900	57,559	12	1004	57,471
10	0956	57,553	12	1101	57,454
10	1100	57,559	12	1201	57,495
10	1156	57,565	12	1300	57,512
10	1259	57,571	12	1402	57,647
10	1400	57,595	12	1459	57,606
10	1459	57,588	12	1600	57,571
10	1602	57,600	12	1659	57,559
10	1648	57,624	12	1800	57,577
10	1800	57,595	12	1900	57,595
10	1856	57,606	12	2004	57,612
10	1958	57,630	12	2055	57,636
10	2056	57,606	12	2200	57,595

DATE (1959)	TIME (GMT)	TOTAL INTENSITY (GAMMAS)	DATE (1959)	TIME (GMT)	TOTAL INTENSITY (GAMMAS)
12 DEC	2300	57,688	14 DEC	2400	57,418
13	0015	57,641	15	0100	57,424
13	0100	57,600	15	0158	57,395
13	0200	57,548	15	0300	57,407
13	0300	57,395	15	0400	57,313
13	0558	57,548	15	0501	57,336
13	0700	57,553	15	0558	57,430
13	0811	57,565	15	0659	57,360
13	0903	57,553	15	0800	57,313
13	0959	57,559	15	0911	57,277
13	1102	57,565	15	1000	57,131
13	1202	57,565	15	1059	57,408
13	1302	57,577	15	1157	57,418
13	1400	57,588	15	1312	57,512
13	1501	57,588	15	1502	57,483
13	1608	57,588	15	1558	57,465
13	1703	57,606	15	2055	57,424
13	1757	57,624	15	2256	57,413
13	1858	57,624	16	0030	57,377
13	2016	57,624	16	0200	57,371
13	2243	57,665	16	0300	57,330
13	2400	57,671	16	0400	57,389
14	0100	57,571	16	0500	57,371
14	0200	57,512	16	0730	57,377
14	0300	57,495	16	0759	57,383
14	0400	57,454	16	1108	57,213
14	0459	57,442	16	1202	57,389
14	0659	57,430	16	1301	57,518
14	0800	57,471	16	1400	57,753
14	0956	57,659	16	1502	57,870
14	1059	57,612	16	1600	57,859
14	1159	57,653	16	1657	57,812
14	1301	57,612	16	1803	57,917
14	1358	57,671	16	1903	57,888
14	1501	57,759	16	2000	57,589
14	1603	57,671	16	2059	57,589
14	1804	57,565	17	0301	57,859
14	1903	57,536	17	0400	57,882
14	1958	57,506	17	0502	57,876
14	2056	57,548	17	0600	57,888
14	2158	57,501	17	0802	57,900
14	2300	57,489	17	0858	57,912

DATE (1959)	TIME (GMT)	TOTAL INTENSITY (GAMMAS)	DATE (1959)	TIME (GMT)	TOTAL INTENSITY (GAMMAS)
17 DEC	1000	57,976	19 DEC	1059	57,084
17	1100	58,029	19	1202	57,195
17	1203	58,064	19	1301	57,254
17	1300	58,135	19	1405	57,201
17	1400	58,112	19	1504	57,272
17	1500	58,070	19	1656	57,184
17	1557	58,064	19	1802	57,184
17	1658	58,064	19	1856	57,148
17	1758	58,064	19	1956	57,095
17	1858	58,141	19	2110	57,066
17	1957	58,129	19	2200	57,049
17	2100	58,111	19	2300	57,049
17	2200	58,099	19	2400	57,031
17	2300	58,058	20	0100	57,025
18	0005	58,064	20	0205	57,025
18	0500	58,041	20	0300	57,013
18	0600	58,005	20	0358	57,002
18	0659	57,988	20	0458	56,984
18	0901	57,988	20	0609	56,984
18	1000	57,994	20	0704	56,972
18	1101	57,988	20	0758	56,960
18	1159	57,959	20	0908	56,943
18	1302	58,000	20	1001	56,955
18	1402	58,005	20	1100	56,960
18	1502	57,935	20	1200	56,990
18	1700	57,747	20	1300	56,978
18	1857	57,565	20	1404	57,043
18	2001	57,489	20	1507	56,996
18	2100	57,448	20	1656	56,996
18	2147	57,383	20	1759	57,007
18	2300	57,266	20	1857	57,066
18	2400	57,201	20	1956	56,990
19	0102	57,101	20	2056	56,972
19	0200	57,072	20	2156	56,943
19	0300	57,007	20	2257	56,919
19	0400	56,955	20	2400	56,925
19	0503	56,931	21	0100	56,937
19	0602	56,919	21	0200	56,955
19	0701	56,984	21	0300	56,955
19	0800	56,825	21	0401	56,955
19	0900	56,937	21	0500	56,943
19	1002	57,078	21	0600	56,937

DATE (1959)	TIME (GMT)	TOTAL INTENSITY (GAMMAS)	DATE (1959)	TIME (GMT)	TOTAL INTENSITY (GAMMAS)
21 DEC	0700	56,937	23 DEC	0359	56,949
21	0756	56,931	23	0500	56,908
21	0900	56,949	23	0600	56,960
21	1002	56,943	23	0700	56,943
21	1058	56,955	23	0900	56,902
21	1200	56,960	23	1000	56,896
21	1300	56,972	23	1100	56,884
21	1358	56,978	23	1158	56,884
21	1503	56,990	23	1259	56,949
21	1603	56,978	23	1400	56,972
21	1656	56,978	23	1500	57,031
21	1757	56,978	23	1700	57,113
21	1857	56,966	23	1800	57,277
21	1959	56,960	23	1859	57,277
21	2100	56,960	23	1959	57,148
21	2159	56,940	23	2100	57,072
21	2300	56,937	23	2156	57,078
21	2358	56,943	23	2259	57,090
22	0059	56,966	23	2400	57,101
22	0200	56,978	24	0100	57,084
22	0259	56,990	24	0200	57,060
22	0404	56,990	24	0300	57,066
22	0500	56,984	24	0400	57,060
22	0600	56,984	24	0500	57,066
22	0702	56,972	24	0600	57,066
22	0803	56,960	24	0700	57,025
22	0901	56,943	24	0800	57,037
22	1000	56,925	24	0900	57,025
22	1103	56,896	24	1000	57,207
22	1203	56,872	24	1101	57,254
22	1304	56,855	24	1202	57,049
22	1502	56,814	24	1309	57,107
22	1559	56,796	24	1400	57,101
22	1656	56,802	24	1503	57,043
22	1800	56,808	24	1602	57,007
22	1857	56,808	24	1700	56,955
22	2103	56,796	24	1758	56,937
22	2300	56,820	24	1858	56,902
22	2400	56,837	24	1959	56,896
23	0100	56,820	24	2058	56,908
23	0200	56,867	24	2159	56,925
23	0303	56,896	25	0100	57,007

DATE (1959)	TIME (GMT)	TOTAL INTENSITY (GAMMAS)	DATE (1959)	TIME (GMT)	TOTAL INTENSITY (GAMMAS)
25 DEC	0200	57,007	27 DEC	0906	57,277
25	0300	56,949	27	1003	57,160
25	0400	56,896	27	1200	57,366
25	0502	56,861	27	1258	57,430
25	0600	56,831	27	1402	57,518
25	0948	56,796	27	1501	57,518
25	1056	56,884	27	1600	57,442
25	1200	56,925	27	1659	57,436
25	1300	56,890	27	1757	57,395
25	1400	56,878	27	1901	57,471
25	1500	56,913	27	1959	57,377
25	1600	56,943	27	2100	57,336
25	2215	56,978	27	2157	57,348
25	2400	57,043	27	2303	57,354
26	0102	57,060	27	2400	57,277
26	0158	57,084	28	0100	57,195
26	0303	57,09	28	0459	57,160
26	0412	57,066	28	0601	57,207
26	0459	57,031	28	0803	57,178
26	0600	57,031	28	0909	57,260
26	0700	57,031	28	1004	57,307
26	0805	57,007	28	1259	57,354
26	0902	57,002	28	1357	57,319
26	1208	57,019	28	1507	57,495
26	1302	57,219	28	1658	57,606
26	1359	57,184	28	1800	57,424
26	1512	57,413	28	1859	57,530
26	1559	57,348	28	2002	57,553
26	1659	57,424	28	2102	57,436
26	1802	57,401	28	2157	57,336
26	1856	57,307	28	2300	57,307
26	1959	57,272	29	0110	57,213
26	2059	57,283	29	0200	57,219
26	2155	57,166	29	0300	57,213
26	2305	57,078	29	0410	57,166
27	0030	57,066	29	0457	57,166
27	0100	57,072	29	0601	57,195
27	0200	57,154	29	0701	57,207
27	0300	57,148	29	0902	57,254
27	0402	57,142	29	1004	57,242
27	0603	57,119	29	1200	57,583
27	0700	57,160	29	1258	57,418

DATE (1959)	TIME (GMT)	TOTAL INTENSITY (GAMMAS)	DATE (1959)	TIME (GMT)	TOTAL INTENSITY (GAMMAS)
29 DEC	1400	57,407	31 DEC	0904	57,101
29	1459	57,407	31	1003	57,207
29	1602	57,383	31	1504	57,295
29	1659	57,354	31	1603	57,272
29	1800	57,313	31	1656	57,307
29	1858	57,277	31	1801	57,295
29	1957	57,236	31	1857	57,295
29	2100	57,236	31	1957	57,289
29	2200	57,236	31	2100	57,313
29	2300	57,213	31	2200	57,260
29	2400	57,231	31	2300	57,260
30	0058	57,219	31	2400	57,301
30	0200	57,236	1 JAN	0100	57,319
30	0300	57,242	01	0200	57,324
30	0400	57,248	01	0300	57,336
30	0500	57,254	01	0400	57,342
30	0600	57,277	01	0458	57,336
30	0700	57,307	01	0602	57,330
30	0800	57,219	01	0659	57,336
30	0900	57,289	01	0759	57,336
30	1003	57,254	01	0902	57,348
30	1159	57,401	01	1000	57,266
30	1302	57,536	01	1100	57,360
30	1404	57,454	01	1220	57,389
30	1501	57,588	01	1307	57,377
30	1602	57,542	01	1400	57,430
30	1659	57,483	01	1502	57,407
30	1800	57,465	01	1603	57,395
30	1859	57,348	01	1657	57,395
30	1959	57,342	01	1802	57,366
30	2058	57,277	01	1905	57,383
30	2200	57,213	01	2000	57,383
30	2300	57,201	01	2100	57,354
30	2358	57,213	01	2157	57,342
31	0100	57,207	01	2300	57,336
31	0200	57,201	02	0002	57,330
31	0300	57,213	02	0100	57,330
31	0400	57,201	02	0200	57,324
31	0458	57,195	02	0300	57,336
31	0556	57,189	02	0405	57,330
31	0657	57,172	02	0501	57,313
31	0800	57,184	02	0600	57,301

DATE (1960)	TIME (GMT)	TOTAL INTENSITY (GAMMAS)	DATE (1960)	TIME (GMT)	TOTAL INTENSITY (GAMMAS)
02 JAN	0659	57,301	04 JAN	2003	57,007
02	0758	57,283	04	2103	57,037
02	0858	57,266	04	2201	56,996
02	0958	57,307	04	2300	56,984
02	1058	57,342	04	2400	56,984
02	1400	57,348	05	0104	57,002
02	1559	57,342	05	0214	57,019
02	1659	57,366	05	0300	56,966
02	1805	57,354	05	0400	56,996
02	1903	57,319	05	0459	57,002
02	1958	57,319	05	0600	56,990
02	2059	57,283	05	0700	57,002
02	2159	57,260	05	0800	57,072
02	2300	57,248	05	0902	57,066
02	2400	57,236	05	1000	57,084
03	0100	57,225	05	1058	57,101
03	0200	57,219	05	1214	57,101
03	0300	57,189	05	1300	57,072
03	0400	57,172	05	1400	57,095
03	0500	57,154	05	1500	57,107
03	0602	57,125	05	1602	57,060
03	0659	57,095	05	1700	56,996
03	0758	57,049	05	1800	56,949
03	0901	57,037	05	1859	56,960
03	1004	57,043	05	2000	56,955
03	1103	57,031	05	2100	56,978
03	1159	57,013	05	2200	57,013
03	1301	57,049	05	2300	57,107
03	1359	57,113	05	2400	57,266
03	1500	57,119	06	0058	57,348
03	1600	57,084	06	0201	57,471
04	0400	56,913	06	0457	58,017
04	0610	56,867	06	0600	58,152
04	0804	56,872	06	0659	58,229
04	0824	56,867	06	0757	58,246
04	1135	56,931	06	0900	58,199
04	1204	56,925	06	0959	58,144
04	1510	56,972	06	1102	58,082
04	1603	56,966	06	1159	58,094
04	1704	56,978	06	1301	58,094
04	1803	56,996	06	1401	58,099
04	1904	57,049	06	1457	58,082

DATE (1960)	TIME (GMT)	TOTAL INTENSITY (GAMMAS)	DATE (1960)	TIME (GMT)	TOTAL INTENSITY (GAMMAS)
06 JAN	1559	58,176			
06	1704	58,088			
06	1800	58,064			
06	1859	57,982			
09	2000	57,923			
06	2059	57,847			
06	2201	57,765			
06	2310	57,724			
07	0200	57,595			
07	0300	57,559			
07	0603	57,442			
07	0759	57,407			
07	0900	57,401			
07	1100	57,430			

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